Exhibit E

IN THE UNITED STATES BANKRUPTCY COURT

FOR THE DISTRICT OF DELAWARE

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In re: Chapter 11

FTX TRADING LTD., et al.,   Case No. 22-11068

        Debtors.   (JTD)

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DEPOSITION OF SABRINA HOWELL

Monday, February 26, 2024

Traci M. Mertens, RDR, CRR, CSR

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1   VIDEOTAPED DEPOSITION OF SABRINA HOWELL,
2 produced, sworn, and examined on February 25, 2024,
3 before Traci M. Mertens, RDR, CRR, CSR.
4   IT IS HEREBY STIPULATED AND AGREED by
5 counsel for that this deposition may be taken in
6 shorthand by Traci M. Mertens, a Certified Realtime
7 Reporter and Certified Shorthand Reporter, and
8 afterwards transcribed into typewriting, and the
9 signature of the witness is reserved by agreement of
10 counsel and the witness.

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1 SABRINA HOWELL: Witness herein, having been
2   duly sworn by the Stenographer,
3   testified as follows:
4
5   *   *   *
6
7   EXAMINATION
8 BY MR. ROSELIUS:
9   Q. Good morning, Professor. My name's Joe
10 Roselius. I'm from DLA Piper, and I represent Maps
11 Vault today.
12   Could you please state and spell your full
13 name for the record.
14   A. Sabrina, S-A-B-R-I-N-A, Howell,
15 H-O-W-E-L-L.
16   Q. Have you ever been deposed?
17   A. I have not.
18   Q. Have you ever testified in court?
19   A. I have not. Oh. Sorry. Yes, I have, on
20 January 31st.
21   Q. Okay. Any other court testimony other
22 than that?
23   A. I testified in the House of
24 Representatives. It's not a court, but it's the
25 only other testimony I've given.

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1   Q. So even though you've testified in court
2 before, a deposition is similar but slightly
3 different. I just want to give you some ground
4 rules, mostly to help us keep a clean transcript and
5 to help out our court reporter.
6   First of all, you're under oath today. Do
7 you understand that?
8   A. I do.
9   Q. The same penalty of perjury applies as if
10 we were testifying in court even though we're in a
11 conference room with no judge here.
12   Do you understand that?
13   A. I understand.
14   Q. You're obligated to answer fully and
15 fairly all of the questions you're asked today.
16   Do you understand that?
17   A. I understand.
18   Q. A transcript of your testimony's being
19 prepared and may be used as evidence in this matter.
20   Do you understand that?
21   A. I understand.
22   Q. Please make sure that you answer out loud
23 because the court reporter can't take down a head
24 nod or a head shake, so -- she can't take that down,
25 so you have to answer yes or no.

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1   A. I understand.
2   Q. Please try to wait for me to finish
3 answering -- or asking my question before you answer
4 it even if you think you know where I'm going. By
5 the same token, I will try to wait for you to finish
6 your answer before I ask my next question so we
7 don't have a lot of crosstalk.
8   Is that fair?
9   A. That sounds like a good plan.
10   Q. If you do not understand one of my
11 questions, please let me know. If you answer it, I
12 will assume that you understood it.
13   Is that fair?
14   A. Yes.
15   Q. If you need a break, please let me know.
16 The only thing I ask is that you answer any question
17 that's pending before we take a break.
18   A. I understand.
19   Q. And there may also be some objections made
20 to preserve the record. Unless you are instructed
21 not to answer, you still have to answer, even if
22 there's an objection.
23   Do you understand that?
24   A. I understand.
25   Q. Have you taken any courses in asset

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1 valuation?
2   A. Not explicitly on asset valuation.
3   Q. What do you mean by that?
4   A. I have a Master's in economics from
5 Harvard University and a Ph.D. in the Political
6 Economy & Government Program economics track from
7 Harvard University. And as part of my course work
8 for those degrees, we studied basic valuation; for
9 example, in the core finance seminar, but I did not
10 take a class explicitly concerning asset valuation.
11   Q. Have you taken any classes, whether in --
12 as part of your education or since then, about
13 valuation of cryptocurrency?
14   A. I have not. When I was studying, such
15 classes, as far as I am aware, did not exist.
16   Q. Okay. When did you get your Ph.D.?
17   A. In 2015.
18   Q. When was Bitcoin invented?
19   A. In 2009.
20   Q. There were no classes about it at that
21 time?
22   A. There were not. As far as I know, the
23 fintech class that I created at NY Stern in 2016 was
24 among the first fintech classes at any top business
25 school in the country.

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1   Q. Do you teach anything about valuation of
2 cryptocurrency as part of the classes that you
3 teach?
4   A. I do.
5   Q. What specifically do you teach about asset
6 valuation?
7   A. As one example, I created a class session
8 about valuing and understanding non-fungible tokens
9 or NFTs, which there are quite a bit of
10 resemblance to some of the tokens at issue in this
11 matter. We talked about valuing the future cash
12 flows associated with those NFTs and
13 distinguishing between fundamental valuation and
14 pricing-based valuation, given the bubble-like
15 characteristics of that market.
16   Q. Which tokens do you think are similar to
17 NFTs?
18   MR. GLUECKSTEIN: Object to the form.
19   Q. (By Mr. Roselius) You can answer.
20   A. All of these tokens are smart contracts
21 that are based on either the -- in the case of the
22 at-issue tokens, the Solana blockchain; in the case
23 of some NFTs, the Ethereum blockchain, and as
24 such, they are similar.
25   Q. You're familiar with the Kyle and

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1 Obizhaeva model?
2   A. I am.
3   Q. Do you teach that as part of your classes?
4   A. I do not.
5   Q. Why not?
6   A. Because in my fintech class, the question
7 of liquidating holdings of digital assets and
8 needing to account for the price impact of such a
9 liquidation is not part of the course material.
10   Q. Do you have any work experience related to
11 asset valuation?
12   A. I worked as an economic consultant as
13 Charles River Associates in 2008 and 2009 and
14 contributed to valuing oil pipeline assets for a
15 major oil company.
16   Q. Does that have anything to do with
17 valuation of cryptocurrency?
18   A. There are common elements in any valuation
19 exercise. You know, understanding the difference
20 between fundamental value and price-based value
21 would be one example, but in general, no. Oil
22 pipelines do not have too much in common with
23 cryptocurrencies.
24   Q. What's the difference between fundamental
25 value and price-based value?

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1   A. Fundamental value reflects future cash
2 flows generated by the asset whereas price-based
3 value reflects what the market is willing to pay at
4 a given moment.
5   Q. Are you offering any opinions about
6 fundamental value of MAPS or OXY or Serum?
7   A. In my estimates of an asset liquidation
8 discount and a discount for lack of marketability
9 for these at-issue tokens, I do not, as part of my
10 assignment, opine specifically on their fundamental
11 value. As input into my calculations in order to
12 try to apply a consistent method for discounting
13 every single digital asset outside of FTT, I was
14 specifically asked to consider fundamental value.
15   However, I do in my rebuttal reports opine
16 on the fundamental value of these assets as it might
17 likely have been assessed on petition time in order
18 to rebut the claims by Mr. Konstantinidis and
19 Mr. Ghatzinas that, in particular, liquidity and
20 volumes would likely have persisted and increased in
21 the future and that market depth would have invoked
22 liquidation in Mr. Konstantinidis' case without any
23 pricing impact whatsoever following the petition
24 date since ex-post events are very much contrary to
25 that assumption.

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1   Q. Your valuation is as of the petition date,
2 correct?
3   A. Correct.
4   Q. And it's based on a hypothetical that the
5 bankruptcy did not occur, is that correct?
6   A. That is not correct.
7   Q. Okay. Why not?
8   A. My assignment is to consider the likely
9 impact on prices in an orderly liquidation that
10 started on a petition date, and where prices are
11 required, I was asked to use petition time prices.
12   The price at the petition time should
13 reflect information available to market participants
14 at that time, including any information about the
15 bankruptcy thus far.
16   I do not believe that the price at
17 petition time had fully incorporated news about the
18 bankruptcy, given that prices continued to decline
19 significantly afterward, but it would be correct
20 that the price at the petition time would
21 incorporate news about the bankruptcy that already
22 was in the public domain.
23   Q. News about the bankruptcy before it was
24 filed?
25   A. News about the collapse of FTX and the

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1 imminent bankruptcy.
2   Q. But then you're looking at things that
3 happened after the petition date to evaluate as of
4 the petition date, is that correct?
5   A. That is not correct. My estimates only
6 incorporate information as of the petition date.
7   Q. Do you hold any --
8   A. Do you want me to opine further on that?
9   MR. GLUECKSTEIN: Wait for him to ask a
10 question, and then go ahead and answer.
11   Q. (By Mr. Roselius) If you have something
12 else to say, please go ahead.
13   A. I don't.
14   Q. Do you hold any licenses or
15 certifications?
16   A. No.
17   Q. Have you ever applied for and been denied
18 a license or certification?
19   A. No.
20   Q. Have you ever been subject to any
21 disciplinary action?
22   A. No.
23   Q. Are you a member of any professional or
24 industry organizations related to cryptocurrency?
25   A. Not explicitly. I'm a research associate

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1 at the National Bureau of Economic Research which
2 includes research on digital assets but is not
3 explicitly focused on digital assets.
4   Q. Your research is related to digital
5 assets, or the organization's research is related to
6 digital assets?
7   A. I have conducted research concerning
8 digital assets, and the NBER members also conduct
9 other research concerning digital assets.
10   Q. What research have you conducted regarding
11 digital assets?
12   A. I published a paper in 2020 about initial
13 coin offerings which is, to my knowledge, the most
14 highly cited paper in financial economics on that
15 topic with around 700 citations to date.
16   In that research paper, I studied several
17 elements of digital asset, token, and coin markets
18 that are directly relevant for my work in this
19 matter, including evaluating market capitalization,
20 aggregating price data, studying token vesting and
21 lockup schedules, and other elements relevant to
22 tokenomics, as it's sometimes called.
23   Q. Other than the ICO paper -- and if I call
24 it that, you know what I'm referring to?
25   A. Uh-huh.

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1   Q. You know what I'm referring to if I call
2 it the ICO paper?
3   A. I do.
4   Q. Other than the ICO paper, have you done
5 any research on cryptocurrency?
6   A. I've done extensive research on
7 non-fungible tokens and their price evolution as
8 well as the role of intellectual property in
9 determining the value of those tokens over time but
10 have not released it as a paper.
11   Q. Any published research, published papers
12 on cryptocurrency other than the ICO paper?
13   A. No.
14   Q. Any non-peer reviewed publications about
15 cryptocurrency other than the ICO paper?
16   A. No.
17   (Exhibits 1 and 2 were marked for
18 identification.)
19   Q. (By Mr. Roselius) The court reporter has
20 marked Exhibit 1 for this deposition. Is that a
21 copy of your declaration dated December 27th of
22 2023?
23   A. It is.
24   Q. As far as you can tell, it's a true and
25 accurate copy of that deposition?

5 (Pages 14 to 17)

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1   A. Yes.
2   Q. I want to direct your attention to Exhibit
3 A at page 56 -- or Appendix A, I should say. Is
4 that your CV?
5   A. Yes.
6   Q. Is it complete and accurate as of when it
7 was filed?
8   A. Yes.
9   Q. Have you ever removed anything from your
10 CV?
11   A. Yes. I'm sure I've removed something
12 sometime.
13   Q. Do you know what it was?
14   A. For example --
15   MR. GLUECKSTEIN: Object to the form.
16   Q. (By Mr. Roselius) You can answer.
17   A. A working paper that later gets published
18 I would have removed and added back as the
19 publication.
20   Q. Anything other than that?
21   A. Not that I can think of at this time.
22   Q. Are there any errors or misstatements in
23 your CV?
24   A. Not to my knowledge.
25   Q. Is there anything missing?

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1   A. I've included everything regarding my
2 professional accomplishments that would seem
3 relevant for the audience that I'm hoping to reach
4 with my CV.
5   Q. What do you mean by that, the audience
6 you're hoping to reach?
7   A. Well, you said does it include everything,
8 so, you know, there are lots of things about my life
9 and work that are not in the CV, like the kind of
10 computer that I own. Obviously, that is not
11 relevant for a CV, so it's not included. I guess
12 I'm a little unsure what you mean by everything.
13   Q. Is there anything relevant to the opinions
14 you're giving in the case that is not included in
15 your CV?
16   A. I don't believe so.
17   Q. Have you ever had any papers that were
18 rejected for publication?
19   A. Yes.
20   Q. What were those?
21   A. As one example, my paper entitled: Does
22 Private Equity Investment in Healthcare Benefit
23 Patients Evidence from Nursing Homes has had
24 extensive policy impact, including being cited in
25 President Biden's State of the Union, and yet, was

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1 rejected from a number of top economics journals and
2 was ultimately published in the Review of Financial
3 Studies which is a top finance journal.
4   Q. Anything that was rejected and not
5 ultimately published?
6   A. The non-peer reviewed publications
7 includes in particular the paper from 2020: How
8 Resilient is Venture Backed Innovation Evidence from
9 Four Decades of US Patenting. That paper has been
10 submitted to a number of journals which found that
11 it was more descriptive than causal, and thus, is
12 remaining a working paper, though it is actually
13 quite highly cited for a working paper. But it is
14 not clear if that will ever get published.
15   Q. Other than the ICO paper, do any of your
16 publications, working papers, and non-peer reviewed
17 publications involve asset valuation?
18   A. One paper that is, I think, relevant to my
19 work on this matter is the one published in the
20 Journal of Corporate Finance called Firm Type
21 Variation and the Cost of Risk Management in which I
22 study how firms hedge oil price risk using futures
23 markets, and that is directly related in particular
24 to my valuation of future positions in my initial
25 report and the rebuttal to Mr. Gkatzimas' report.

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1   Q. Does that have anything to do with your
2 application that discounts the MAPS or OXY or Serum?
3   A. No.
4   Q. Any other papers that are relevant to your
5 opinions about the discounts to MAPS and OXY and
6 Serum?
7   A. No.
8   Q. Have you ever cited the KO -- if I refer
9 to the KO 2016 paper, do you know what I mean?
10   A. I do.
11   Q. Have you ever cited that paper in any of
12 your other work?
13   A. No.
14   Q. Why not?
15   A. As I mentioned, I haven't conducted
16 academic work in which I estimate asset liquidation
17 discounts.
18   Q. You used the word academic. Have you done
19 other work where you estimate asset liquidation
20 discounts?
21   A. No.
22   Q. Do any of your current research interests
23 relate to valuation of cryptocurrency tokens?
24   A. Just to clarify, you mean research I'm
25 currently undertaking?

6 (Pages 18 to 21)

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 1      Q.  Correct.
 2      A.  I am working on a case with a Harvard
 3  Business School professor on the economics of air
 4  drops which is where projects or protocols in the
 5  crypto economy give away free tokens in order to
 6  encourage participation on the platform which, for
 7  example, Sam Bankman-Fried did with Serum.  And so
 8  that is an ongoing -- an ongoing project in which we
 9  will consider the valuation of these airdropped
10  tokens.
11      Q.  Are you using the KO model as part of that
12  research?
13      A.  No.
14      Q.  Why not?
15      A.  Because in an airdrop, you give away
16  tokens for free.  You don't sell them.
17      Q.  So would it be fair to say that that
18  doesn't actually have anything to do with the
19  opinions you're giving in this case?
20      MR. GLUECKSTEIN:  Object to the form.
21      Q.  (By Mr. Roselius) You can answer.
22      A.  I think my expertise on this matter stems
23  from my deep understanding of the crypto economy,
24  and my economics training allows me to bring the
25  most well-founded and well-regarded liquidity models
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 1  to bear on the crypto economy.
 2      Q.  What did you do to prepare for your
 3  deposition today?
 4      A.  I closely reviewed my reports and the
 5  reports of the opposing expert.  I had several calls
 6  with my collaborators at Analysis Group and with
 7  counsel at Sullivan & Cromwell.
 8      Q.  How many calls did you have with Analysis
 9  Group?
10      A.  To clarify, specifically for preparing for
11  the deposition?
12      Q.  Sure.
13      A.  I think two.
14      Q.  How long were the calls?
15      A.  They were scheduled for two hours and
16  three hours, respectively.  I'm not sure we used the
17  full second three hours.
18      Q.  How many calls did you have with Sullivan
19  & Cromwell?
20      A.  Two.
21      Q.  How long were those calls?
22      A.  I believe they were two hours each.
23      Q.  Did you use --
24      A.  One of the exact -- I would have to look
25  at my calendar for all of this, but it's somewhere
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 1  between two and three calls with each group.
 2      Q.  Did you use the full time for those kind
 3  of calls?
 4      A.  I believe we did.
 5      Q.  Other than what you've already mentioned,
 6  did you review any documents?
 7      A.  Yes.  I looked at research papers,
 8  including Kyle and Obizhaeva 2016.
 9      Q.  Any other papers besides KO 2016?
10      A.  Yes.  I looked at a more recent paper,
11  Kyle and Obizhaeva 2023, which is used in my
12  rebuttal to Mr. Konstantinidis.
13      Q.  Any others other than the two Kyle and
14  Obizhaeva papers?
15      A.  I believe I looked again at Cong, et al.
16  2023 on the large share of token volume on top
17  exchanges that is fraudulent wash trading.
18      Q.  Any other papers?
19      A.  I -- may I review the list of works cited
20  to make sure?
21      MR. GLUECKSTEIN:  Just tell him what you
22  recall.
23      THE WITNESS:  What I recall.
24      A.  I also probably looked at Kyle and
25  Obizhaeva 2020 where they show that that invariance
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 1  hypotheses continued to hold using updated data.
 2  That's all I can recall for now.
 3      Q.  (By Mr. Roselius) That was in the 2020
 4  paper?
 5      A.  Correct.
 6      Q.  Have you ever previously served as an
 7  expert witness?
 8      A.  I have been retained on cases, yes, and
 9  have drafted reports.  In the case that went all the
10  way to report, the parties settled so I wasn't
11  deposed, but my report was used in part of the
12  settlement process.
13      Q.  What case was that?
14      THE WITNESS:  Am I allowed to talk about
15  that?
16      MR. GLUECKSTEIN:  You can reveal the case.
17  If you have confidentiality agreements, you don't
18  need to get into the details.
19      A.  It was called Beard vs. Ascia, and it
20  concerned option-based compensation with vesting
21  schedules which actually has -- it's not entirely
22  unrelated to some of the topics in this matter.
23      Q.  (By Mr. Roselius) Was there any challenge
24  to your qualifications as an expert in that case?
25      A.  No.
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1   Q. Was there any challenge to your opinion in
2 that case --
3   A. No.
4   Q. -- to get it stricken or removed or
5 something like that?
6   A. Not that I know of.
7   Q. Was your opinion limited in any way by the
8 court or arbitrator?
9   A. No.
10   Q. Have you served as an expert in any other
11 case?
12   A. No.
13   Q. What was the scope of your assignment in
14 connection with this case?
15   A. I was asked by counsel on behalf of FTX to
16 firstly, assess the likely prices at which the
17 debtor would be able to liquidate all of its
18 holdings of digital assets and apply those discounts
19 where they are in excess of 10 percent to customer
20 claims.
21   I was also asked to consider any discounts
22 for lack of marketability required by contractual
23 restrictions on trading that were included in some
24 customer claims to assets.
25   Finally, I was asked to opine on the

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1 fundamental value of FTT and other equity-like
2 assets to which customers had claims.
3   Q. You were not asked to opine on the
4 fundamental value of MAPS or OXY, is that correct?
5   A. Correct.
6   Q. You were specifically asked to apply
7 discounts, is that correct?
8   A. I was asked to consider if any discounts
9 would be warranted as part of an orderly liquidation
10 process commencing on the petition date.
11   Q. What other discounts did you consider?
12   A. I considered a number of possible
13 alternative models for asset liquidation discounts
14 such as the Abihud 2002 measure or the Chris
15 Holmgren measure or the linear Kyle Obizhaeva
16 measure.
17   I believe the KO 2016 model has the best
18 grounding in economic theory that presents a close
19 analogy in the form of the idea of a bet to the exit
20 of position, a large position, over a long timeframe
21 that the debtor is planning to undertake.
22   And furthermore, in practice, I found that
23 the KO 2016 model produced smaller discounts than
24 the others that I considered closely, and therefore,
25 it seemed a conservative choice.

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1   Q. Did any of the other models you considered
2 ever produce a discount of more than 70,000 percent?
3   A. I don't recall the specific discounts
4 produced by the model for every asset in every
5 iteration that we considered.
6   Q. Did any of the other models you considered
7 ever produce a discount of more than 7,000 percent?
8   A. Again, I do not recall the specific
9 discounts for specific assets. I can tell you that
10 the results are almost invariably 100 percent for
11 MAPS and OXY and are usually higher than by 58
12 percent for Serum across a wide range of sensitivity
13 tests that I conducted.
14   Q. There's a difference between the
15 discount -- the ultimate discount and what the model
16 produces, correct, if it's over a hundred?
17   A. Can you clarify which model?
18   Q. If the model produces an output of over
19 100 percent discount, that's different than
20 producing a 100 percent discount, correct?
21   MR. GLUECKSTEIN: Object to the form.
22   Q. (By Mr. Roselius) You can answer.
23   A. The fact that the result of these models
24 is often in excess of 100 percent reflects the
25 extreme illiquidity of these markets, given the

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1 large debtor holdings. They don't suggest anything
2 wrong with the models themselves.
3   Q. That's not my question. My question is:
4 Some of these models are returning a discount of
5 more than 100 percent, correct?
6   A. Correct.
7   Q. And then you modify that down to 100
8 percent as your opinion, correct? A hundred percent
9 discount?
10   A. Correct.
11   Q. So when you say that some of these other
12 models that you considered produced discounts that
13 were higher than the KO 2016 model, you're saying
14 they were also producing discounts of above a
15 hundred percent, is that correct?
16   A. Not necessarily. In fact, my agenda in
17 choosing and evaluating the KO model against
18 alternatives was based on applying a consistent
19 methodology to 1,321 digital assets in the debtor's
20 holdings. And for many of those, the discount
21 calculated was well under a hundred percent across
22 all the methods that I considered.
23   It is only for the -- you know, for the
24 at-issue tokens we have this extremely large
25 concentration of the debtor's holdings relative to

8 (Pages 26 to 29)

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1 regular trading volume, but that is, in fact, not
2 true for the majority of assets that I considered.
3   So in comparing discounts for a more
4 liquid asset such as Bitcoin, all of the discounts
5 produced by the models that I considered were well
6 under a hundred percent.
7   Q. What other discounts did you consider?
8   A. It's all laid out in my report for -- in
9 the rebuttal to Mr. Konstantinidis' report, I
10 specifically provide, I believe, five or six
11 alternatives, so that's a place we could look to
12 talk about specifics, and the formulas are in the
13 appendix to that report, so I'm happy to go through
14 that.
15   In developing my initial report, I
16 considered a subset of those that are listed in the
17 Konstantinidis rebuttal; notably, the square root
18 model, the Amihud 2002 measure, and we also
19 considered Kyle and Madhavan. I'm forgetting what
20 year that model was published. Those are the ones I
21 can recall for now.
22   Q. Did you consider any types of discounts or
23 models other than the asset liquidation discount and
24 the discount for lack of marketability?
25   A. I considered an alternative approach where

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1 for tokens with extreme illiquidity where the debtor
2 is holding at least -- in the case of the at-issue
3 tokens, at least 95 percent of all tokens supplied.
4   A reasonable alternative in that subset of
5 cases would have been to assume that the market
6 would quickly unravel when the debtor began to
7 liquidate, and prices would go to zero immediately.
8   However, it did not seem as defensible to
9 use different models for different assets where that
10 was not part of my assignment, so I decided to apply
11 one asset liquidation discount process to all
12 tokens, even in these cases where the debtor is
13 holding between 400 and 20,000 times daily trading
14 volume.
15   Q. What kind of model is that? What would
16 you call that model?
17   DEFENSE COUNSEL: Object to the form.
18   Q. (By Mr. Roselius) You can answer.
19   A. Perhaps I would call it dynamic
20 information-based discounts.
21   Q. And you chose not to do that because you
22 think that model would not apply similarly to the
23 liquid tokens, is that correct?
24   A. Yes. Many of the tokens in the debtor's
25 holdings could plausibly be liquidated in an orderly

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1 manner with minimal impact on the price. And so
2 therefore, it would not have been reasonable to
3 apply that market unraveling assumption to all of
4 the assets.
5   Q. Did you consider any other discounts,
6 other than what we've already talked about?
7   A. No.
8   Q. When were you retained in this matter?
9   A. My recollection is September 2023, but I
10 don't recall exactly.
11   Q. Who contacted you?
12   A. I was contacted by counsel at Sullivan &
13 Cromwell on behalf of the debtor and working with
14 Analysis Group.
15   Q. You were contacted by Sullivan & Cromwell
16 to work with Analysis Group?
17   A. My first inquiry on this matter came from
18 an executive at Analysis Group asking me to
19 interview with lawyers and Mr. John Ray from FTX in
20 order to be considered as an expert on this case
21 working for Sullivan & Cromwell on behalf of the
22 debtors.
23   Q. How was the matter described to you?
24   A. I believe that -- you mean on the initial
25 interview call?

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1   Q. Yeah.
2   A. I believe it was very general. Mr. John
3 Ray and Mr. Brian Glueckstein here provided an
4 overview of the FTX bankruptcy and asked me -- I
5 believe it was essentially a -- a testing
6 exercise -- to opine on the fundamental and market
7 value of the FTT token in particular, so that's what
8 we discussed for much of the call.
9   Q. Was there any discussion of valuation of
10 other digital assets on that call?
11   A. Not that I recall.
12   Q. Overall, how much time have you spent on
13 this assignment?
14   A. I don't recall exactly. I could look at
15 my invoices, but I think on the order of 150 hours.
16   Q. You've worked with other people on the
17 assignment, is that right?
18   A. Yes.
19   Q. Who did you work with?
20   A. I worked with a team at Analysis Group who
21 gathered data and conducted estimation on my
22 direction.
23   Q. When were you first asked to opine on the
24 valuation of digital assets?
25   A. Shortly after I was formally retained, I

9 (Pages 30 to 33)

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1 received the assignment to estimate the prices at
2 which the debtor would likely be able to sell its
3 holdings in a liquidation process commencing on the
4 petition date. That was the first part of the
5 assignment that was related to me.
6   Q. Were discounts discussed during that
7 conversation?
8   MR. GLUECKSTEIN: Objection. Object to
9 the form.
10   I caution you not to reveal any
11 information after your retention that involves
12 discussions with counsel.
13   Q. (By Mr. Roselius) You can answer.
14   A. I believed it was appropriate to consider
15 any discounts that might be reasonable in a
16 liquidation process, and due to restrictions on
17 marketability of customer assets, and finally, due
18 to equity and equity-like claims in FTX that might
19 be affected by the bankruptcy process.
20   Q. Do the equity and equity-like claims in
21 FTX have anything to do with MAPS or OXY or Serum?
22   A. They don't as far as my estimates of the
23 asset liquidation discount and the discount for lack
24 of marketability are concerned. However, I do opine
25 on the fundamental value of these tokens as part of

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1 my rebuttals because of their close tie to FTX and
2 Mr. Sam Bankman-Fried which arguably outside of FTT
3 make them unique among all of the digital assets
4 that I considered, and the fact that their
5 fundamental value was likely negligible on the
6 petition date is the result of their dependence on
7 FTX, and in the case of Serum, the fact that Mr. Sam
8 Bankman-Fried had created and controlled the
9 protocol.
10   Q. Is negligible the same thing as zero?
11   A. I used the word negligible since I did not
12 conduct a formal economic analysis. But for the
13 purposes of valuing customer claims or considering a
14 liquidation process, I believe they are conceptually
15 equivalent.
16   Q. You did not conduct a formal economic
17 analysis of the fundamental value of MAPS or OXY or
18 Serum, is that correct?
19   A. That's correct.
20   Q. Are there any subjects on which you were
21 asked to opine but you declined to do so?
22   A. Not that I can recall.
23   Q. Is there anything that you reviewed to
24 form your opinions in your initial report that was
25 not listed in Appendix B to Exhibit 1?

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1   A. I don't believe so, no.
2   Q. Of the documents on Appendix B to
3 Exhibit 1, were any specific documents other than
4 pleadings provided to you by counsel?
5   A. The data that I used in my calculation
6 was, in some cases, provided by the debtors or by
7 Alvarez and Marsal working on behalf of the debtors,
8 and I am not aware of whether counsel may have been
9 in the middle of that transfer of data.
10   Q. So setting aside the data in the
11 pleadings, were any of the articles, books and
12 studies, or websites provided to you by counsel?
13   A. No.
14   THE WITNESS: Can we take a break?
15   MR. ROSELIUS: Sure.
16   (A break was taken.)
17   Q. (By Mr. Roselius) What's the difference
18 between a coin and a token?
19   A. A coin is the native cryptocurrency of a
20 blockchain such as Bitcoin on the Bitcoin blockchain
21 or ETH on the Ethereum blockchain whereas a token is
22 a smart contract built on another blockchain. So,
23 for example, FTT is a smart contract on the Solana
24 blockchain where it's sold as the native coin for
25 the Solana blockchain.

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1   Those are the definitions that I use that
2 I mentioned at the outset of my report. However, in
3 the industry, you often hear these terms used
4 interchangeably.
5   Q. For the purposes of our -- of your
6 deposition here today, we'll use the ones that you
7 use, okay?
8   A. Okay.
9   Q. What's the difference between a security
10 token and a utility token?
11   A. A utility token offers consumptive rights
12 to a product or service while a security token
13 represents a traded asset such as a stock or a bond
14 on the blockchain.
15   Q. And some digital assets can fit into both
16 of those categories, is that right?
17   A. And more. Correct.
18   Q. And could also be more like a coin as
19 well?
20   A. The way I define coin and token is
21 mutually exclusive.
22   Q. Is that how you defined them in your ICO
23 paper?
24   A. I believe so, though I would not be
25 surprised if in that paper and potentially all of

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1 these reports there are cases where sometimes I, or
2 we in the case of my coauthors, used the words coin
3 and token more interchangeably.
4   Q. Can tokens also function as a stored
5 value?
6   A. Yes.
7   Q. Is MAPS a coin, a security token, a
8 utility token, or some combination?
9   A. I would describe MAPS as the governance
10 and utility token associated with the Maps.me
11 project offering its users rights to Maps.me
12 revenues, governance over Maps.me decisions, and
13 discounts on various Maps.me products which, as I
14 understand, were related to travel.
15   Q. So it's more like a utility token with
16 some other associated characteristics?
17   A. I would classify it as a utility token
18 with governance rights.
19   Q. How would you classify OXY?
20   A. I would also classify OXY as a utility
21 token in that it offered to users consumptive rights
22 to the Oxygen borrowing and training protocol.
23   Similarly, I would say it also had
24 governance rights, as I understand how the Oxygen
25 protocol operated.

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1   Q. In the ICO paper, you say that a utility
2 token's, quote, value is often expected to increase
3 with the value of the decentralized network, end
4 quote.
5   Is that referring to the underlying
6 network or the platform that's specific to the
7 token?
8   A. The platform specific to the token. So in
9 the case of MAPS, the value of the token depends on
10 the performance and success use of the Maps.me
11 application and not on the underlying Solana
12 blockchain.
13   Q. Is the same true of OXY?
14   A. Yes.
15   Q. Can tokens have value that's separate from
16 the value of the underlying platform?
17   A. They may have speculative value based on
18 the belief of market participants.
19   Q. So would it be fair to say that tokens
20 such as MAPS or OXY can have both -- can have, let's
21 say, three types of value; one would be the value
22 would be the value of the underlying platform, two
23 would be the speculative value you just discussed,
24 and is there also a third aspect of the value which
25 is sort of what you can redeem them for on the

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1 platform?
2   MR. GLUECKSTEIN: Object to the form.
3   A. The third element you described, what you
4 can redeem them for on the platform I don't think
5 describes any of the at-issue tokens in that you
6 couldn't really send in the tokens to the platform
7 and redeem them for anything. I think the tokens
8 offered holders certain benefits from using the
9 platforms, which is perhaps what you're getting at.
10   Q. So that would be -- I'm sorry. I didn't
11 mean to cut you off.
12   A. No, no. It's okay.
13   Q. Were you finished?
14   A. I think to try to answer your question in
15 terms of these multiple sources of value, I believe
16 the fundamental value is solely tied to the success
17 and performance of the application, so the Oxygen
18 protocol in the case of OXY and Maps.me in the case
19 of MAPS, and the Serum exchange in the case of
20 Serum.
21   And to the degree that, for example, those
22 applications might be defunct, yet, there is a
23 positive price of the token in markets, I can only
24 speculate but would hypothesize that that reflects
25 speculative trading by market participants.

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1   Q. Do tokens have associated liabilities?
2   A. Not that I'm aware of.
3   Q. Can tokens have negative value?
4   A. Not that I'm aware of.
5   Q. Does your ICO paper -- let me say that
6 differently.
7   Your ICO paper does not provide a model
8 for calculating the value of a token, is that
9 correct?
10   A. Correct.
11   Q. And it doesn't provide a model for
12 calculating the value of a customer claim, is that
13 correct, in this -- for this bankruptcy?
14   A. No.
15   Q. Did you rely on that paper in calculating
16 the value of the customer claims in this case?
17   A. I relied on my expertise about
18 cryptocurrency markets that came, in some
19 significant portion, from that paper but not on any
20 explicit data or inputs or regressions from the ICO
21 paper.
22   Q. So it would be fair to say that you did
23 not rely on the ICO paper in calculating the
24 discounts that are your opinion in this case?
25   A. Correct. Well, sorry. I just have one

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1 exception which is the fact that I assessed in my
2 initial report the fundamental value of FTT to be
3 zero relied on the way I defined tokens in the ICO
4 paper.
5   Q. Why did you use CoinMarketCap for the ICO
6 paper?
7   A. At the time I was collecting data in early
8 2017, the industry was much less mature, and Coin
9 Metrics had either just been founded or wasn't yet
10 founded and didn't cover a large range of assets and
11 didn't have the high quality reputation among
12 financial institutions that it does today. Instead,
13 the only, in our view, real player in the game was
14 CoinMarketCap which had been around in 2013 and
15 covered a wide range of assets.
16   The immaturity of the industry is relevant
17 because at that time, there were, as far as I know,
18 no academic papers on the prevalence of wash
19 training for fraudulent volume on cryptocurrency
20 exchanges, and so we could not incorporate such
21 information. I'm not even sure if market
22 participants were engaged in as much wash trading as
23 they were in later years.
24   And finally, the purpose of the data
25 gathering exercise in the ICO paper was different

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1 from the data gathering exercise for my analysis in
2 this matter in that there we wished to cast as wide
3 a net as possible and, in fact, wanted to include
4 esoteric tokens that were scams or frauds precisely
5 in order to correlate the characteristics of those
6 projects relative to higher quality projects with
7 outcomes.
8   Whereas in this matter, I was interested
9 in taking an inclusive approach to identifying
10 liquidity that could reasonably absorb sales of the
11 debtor's holdings, and thus, wanted to balance a
12 source of data that would include legitimate trading
13 so as not to be dominated by wash trading with also
14 trying to be, again, conservative and inclusive in
15 my choice of exchanges.
16   And so I didn't want to use CoinMarketCap
17 because the additional exchanges that CoinMarketCap
18 covers relative to the Coin Metrics dataset are very
19 low trust and are known to be dominated by wash
20 trading.
21   Q. The wash trading that you're talking about
22 is based on the exchange, not the token, is that
23 correct?
24   A. Correct.
25   Q. Do you have any evidence -- have you seen

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1 any evidence of wash trading in MAPS or OXY or
2 Serum?
3   A. I believe that the measures of wash
4 trading that have been established in the literature
5 apply across all significant tokens on the
6 exchanges.
7   Q. That wasn't my question. My question is
8 have you seen any evidence of wash trading in MAPS
9 -- I'll just break them apart. We'll do all three.
10   Have you seen any evidence of wash trading
11 in MAPS?
12   A. No.
13   Q. Have you seen any evidence of wash trading
14 in OXY?
15   A. No.
16   Q. Have you seen any evidence of wash trading
17 in Serum?
18   A. No.
19   Q. What is the source of the term asset
20 liquidation discount?
21   A. It's a term that I use to describe the
22 discounts from liquidating assets, so I just put
23 those words in a different order.
24   Q. So did you come up with the term?
25   A. I don't recall if the first use of the

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1 three words in that order was on my part or on the
2 part of my collaborators at Analysis Group, but it
3 was one of us.
4   Q. So is that a standard term in the
5 valuation industry?
6   A. Yes. I think you will find it.
7   Q. Do any of the articles you relied on refer
8 to an asset liquidation discount?
9   A. I can't recall. I'd have to go through
10 them.
11   Q. So you can't point to anything before you
12 -- either you or someone at Analysis Group came up
13 with the term?
14   A. I think the concept of selling holdings
15 and having an impact on price from those sales is
16 very well established, is, for example, the subject
17 of the Kyle and Obizhaeva papers that I cite, and so
18 I'm very comfortable with using this term to
19 describe sales of positions and associated price
20 impact, for example, in the Kyle and Obizhaeva
21 paper.
22   Q. Does the Kyle and Obizhaeva paper refer to
23 an asset liquidation discount? The 2016 paper, I
24 mean.
25   A. They primarily refer to transaction costs.

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1   Q. Do they use the term discount at all in
2 the paper?
3   A. No, but I don't think that's relevant to
4 my use of the model in this matter.
5   Q. So are transaction costs and the discount
6 identical?
7   A. Yes. They are different words for the
8 same percent of price.
9   Q. So the entire discount you applied in this
10 case is based on transaction cost?
11   MR. GLUECKSTEIN: Object to the form.
12   Q. (By Mr. Roselius) You can answer.
13   A. Entire discount -- you're just referring
14 to the asset liquidation discount right now --
15   Q. Correct.
16   A. -- and discount for lack of marketability?
17 Yes. The Kyle and Obizhaeva model has two
18 components, a bid ask spread cost and a price impact
19 cost, and those two together are the transaction
20 costs which are a percent of the price. It's a
21 percent of costs, and I refer to that as a discount.
22   However, it would be equally correct to
23 have referred to it throughout as a percent of
24 petition date press.
25   Q. If you have an asset that has a price of

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1 $100 and a discount of 50 percent, how much is that
2 asset worth, in your opinion?
3   MR. GLUECKSTEIN: Object to the form.
4   A. Taking 50 percent off of $100 is $50.
5   Q. (By Mr. Roselius) Again, assume the price
6 is $100. The discount is 75 percent. How much
7 would it be worth?
8   A. $25.
9   Q. If it's a hundred percent?
10   A. Zero dollars.
11   Q. What if it's 200 percent?
12   A. Zero dollars because we do not believe
13 it's reasonable to have negative customer claims
14 values.
15   Q. Why not?
16   A. So I believe that Mr. Konstantinidis may
17 have made a mistake in looking at the formula
18 because he suggests that we are truncating discounts
19 at zero and 100 percent and somehow that that's a
20 problem.
21   In fact, with positive holdings in
22 positive places, you can't have negative discounts.
23 And having the formula produce more than a hundred
24 percent reflects the intense illiquidity of these
25 markets relative to their daily trading volume.

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1   And so -- and it is, in fact, much more
2 plausible that they would produce more than a
3 hundred percent discount, that would have to be
4 truncated at a hundred percent, then the models that
5 Mr. Konstantinidis uses which are arbitrarily capped
6 at 32 percent for one of the models, and for the
7 other one has the bizarre implication that actually
8 the discount declines at longer horizons.
9   Q. So how did you -- you capped the discount
10 at a hundred percent, regardless of what the model
11 put out, correct?
12   A. Correct.
13   Q. So even if you changed some of the inputs
14 and the output of the discount model that you used
15 changed, you still left it at a hundred percent?
16   A. That's correct.
17   Q. And I know you just talked about whether
18 the discount could be negative. You're referring to
19 a discount that is negative, not a discount that's
20 200 percent.
21   A. Correct.
22   Q. Okay. So with respect to discounts that
23 are over 100 percent, those still get capped at a
24 hundred percent?
25   A. That's correct.

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1   Q. Because it doesn't make sense to have a
2 200 percent discount?
3   A. We -- I do not believe having the
4 customers pay the estate is part of the scope of the
5 liquidation process in bankruptcy.
6   Q. Well, why would the customers have to pay
7 the estate if the discount is over a hundred
8 percent?
9   A. Well, just that -- if the position were
10 somehow, you know, to be negative.
11   Q. The tokens don't --
12   A. It's -- it's pretty standard in these
13 models that with extreme volatility -- with, you
14 know, high volatility and these extraordinarily
15 large holdings relative to daily trading volume that
16 would not plausibly exist in a normal market,
17 environment.
18   For example, in the case of MAPS where
19 holdings are 20 -- almost 20,000 times daily trading
20 volume, it is natural that the formula would produce
21 a discount of over a hundred percent, and we then
22 truncated at 100 percent. It does not mean that the
23 formula is incorrect in any way, that it produces a
24 discount of over 100 percent.
25   Q. But why truncate it, then?

13 (Pages 46 to 49)

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1   A.   It would have -- it could have been
2   reasonable to report the discounts produced by the
3   model, but I don't think that that would have been
4   the most useful way to present the results since we
5   are, as I mentioned, not suggesting that claims
6   could have -- would have negative value.
7   Q.   Did you say --
8   A.   And to be clear, the discount is a way of
9   thinking about the ability of markets and the depth
10   that exists in markets to absorb debtor holdings.
11   That's where the discount is coming from. It's not
12   from a fundamental value of, for example, the
13   tokens' future cash flows themselves.
14   Q.   So is it your opinion that if the KO model
15   output a discount of 70,000 percent that that means
16   the tokens have negative value?
17   A.   No. That's what I was just getting at is
18   that the purpose of the model is to understand the
19   likely impact on the price of selling the holdings.
20   And so when you have holdings that are,
21   you know, in this case 6,000, 20,000 times daily
22   trading volume, they would drive -- selling those
23   holdings would, in practice, drive the price quickly
24   to zero, and it would remain at zero.
25   The formula produces a discount in excess

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1   of a hundred percent, and that represents, in a
2   sense, the inability of these markets to
3   realistically absorb the quantity of debtor
4   holdings.
5   Q.   Does the price ever go below zero?
6   A.   No.
7   Q.   How does the KO model work? Can you just
8   explain it to me?
9   MR. GLUECKSTEIN: Object to the form.
10   Q.   (By Mr. Roselius) You can answer.
11   A.   There are two components to the KO model.
12   One is a bid out spread cost, and one is a
13   transaction cost. I'm sorry. One is a price impact
14   cost. Together, they form the transaction cost.
15   Each term is associated with a coefficient that KO
16   has calibrated using data on portfolio transitions.
17   But it's all laid out in the appendix of
18   my initial report, so I'd be happy to talk through
19   that more specifically.
20   Q.   Does the KO model measure anything other
21   than the bid ask cost and the price -- you said the
22   bid ask cost, and what was the other one?
23   A.   The price impact.
24   Q.   The price impact. Does it measure
25   anything else?

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1   A.   Do you mean what are the specific -- just
2   to be clear, like, what are the specific components
3   of the formula?
4   Q.   Well, I'm asking you to explain your
5   opinion, not what's in your report.
6   MR. GLUECKSTEIN: Just answer what you
7   know. Tell him what you recall.
8   A.   The required inputs to the KO formula are
9   regular trading volume, regular volatility, the
10   price, and the holdings to be sold. And the
11   remaining terms in the formula are calibrated
12   estimates by KO that translate those objects I just
13   described into a transaction cost that would be
14   incurred from selling those holdings at a market
15   equilibrium defined natural speed of trading.
16   Q.   How are the estimates calibrated?
17   A.   They are calibrated using data from the
18   NASDAQ and the New York Stock Exchange in the early
19   2000s.
20   Q.   Has anyone ever tried to calibrate the KO
21   model with tokens?
22   A.   In a 2021 paper published in the Journal
23   of Banking and Finance, which is a high quality
24   journal, it shows that liquidity measure from KO
25   characterizes digital asset markets better than

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1   available alternatives.
2   Q.   You said it was a high quality journal.
3   Is it the same level of quality as, say,
4   Econometrica?
5   A.   Not quite so high quality.
6   Q.   How do you define high quality?
7   A.   Both of those journals are well
8   established, peer reviewed. Econometrica is what's
9   called a top five economics journal and is, you
10   know, one of the -- it's probably the very, very top
11   journal for new methods. The Journal of Banking and
12   Finance is a high quality journal for financial
13   economics. Unlike Econometrica does not have so
14   much prestige in the economic side of the field, but
15   it is -- for example, it would be included in a
16   candidate for tenure's packet as a, you know, top
17   finance publication at most departments.
18   Q.   If Econometrica is a top five journal,
19   where would you rank the Journal of Banking and
20   Finance, approximately? The top 100?
21   A.   In a finance department or in an economics
22   department?
23   Q.   For both.
24   A.   I can only speak to a finance department
25   where I sit on a promotion and tenure committee, and

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1   I would say it is top ten.
2   Q. In finance?
3   A. In finance.
4   Q. What about economics?
5   A. At the very tippy-top departments, I'm --
6   you know, I really can't speak to that because I
7   don't have any experience as a professor in an
8   economics department.
9   Q. Why did you choose the KO model?
10   A. The KO model was the alternative that had
11   the strongest grounding in economic theory that was
12   built on insights designed to be applied across
13   diverse type markets and asset classes and was
14   conservative in the discounts it yielded relative to
15   other methods.
16   Q. Did you choose the KO model before you saw
17   the results of the different models?
18   A. No. We estimated, as I mentioned earlier,
19   three or four alternatives for asset liquidation
20   discounts at the same time, and I ultimately settled
21   on the KO 2016 model as the most defensible option.
22   Q. What do you mean by most defensible?
23   A. In that it is best grounded in economic
24   theory and arguably applicable to digital asset
25   markets.

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1   Q. Why do you say it's applicable to digital
2   asset markets?
3   A. The authors describe their formula as a
4   universal model of market impact because it is
5   derived from these market microstructure invariance
6   hypotheses which apply across asset classes.
7   They note in their original paper that the
8   formula can apply to commodities, to foreign
9   currency exchange, to fixed income markets, and then
10   the two authors themselves use exactly the same
11   calibrated formula in follow-on work with data on US
12   treasuries, on corporate bonds, and on historical
13   stock market crashes going back to 1929.
14   They point out that market structure
15   characteristics such as in-person trading versus
16   electronic trading or tick sizes or information
17   asymmetry should not affect the invariance
18   hypotheses that the formula relies on and that it is
19   correct to apply to those diverse markets.
20   And I would speculate that, in fact, these
21   digital asset markets are -- have more market
22   microstructure similarity to stock markets than some
23   of these other markets to which KO has applied their
24   theory, though that is, sort of in a sense,
25   fundamentally untestable.

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1   Q. So you're saying it's impossible to test
2   whether the KO model applies to cryptocurrency
3   markets?
4   A. No. That is not what I meant. In fact, I
5   conducted analysis that tested the invariance
6   hypothesis in my data on cryptocurrency markets and
7   found that it broadly held, though the data are
8   noisy.
9   And furthermore, Brauneis 2021, as we
10   previously discussed, actually shows that the
11   liquidity measure characterizes digital asset
12   markets well.
13   Q. Characterizes markets but not values?
14   A. Characterizes liquidity which is what
15   we're interested in for this matter.
16   Q. What other models did you consider for the
17   asset liquidation discount?
18   MR. GLUECKSTEIN: Objection; asked and
19   answered.
20   Q. (By Mr. Roselius) You can answer.
21   A. I considered several alternative models
22   including the square root model, the Amihud 2002
23   model, the Kyle Madhavan, M-A-D-H-A-V-A-N, model.
24   Q. Do any of those other models produce
25   discounts above 100 percent for MAPS and OXY?

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1   A. I would need to go and look at the
2   analytical results to be sure, but I believe so.
3   Q. Which ones?
4   A. I don't recall off the top of my head, but
5   we have all of that material.
6   Q. Are you familiar with the term blockage
7   model?
8   A. If we -- sorry. Go back. If we look at
9   Figure, I think, 5 of the rebuttal report -- yes.
10   So here in Figure 5, you see that using almost all
11   of the other methods, the discounts are always --
12   sorry. Using all of the other seven methods, the
13   discounts are invariably a hundred percent for MAPS
14   and OXY. And I'm reasonably sure that in almost, if
15   not all of those cases, the models are producing a
16   more than 100 percent discount that we're truncating
17   at 100 percent.
18   Q. Why truncate the discount at 100 percent?
19   A. Because the purpose of the exercise is to
20   understand the likely impact on the price of
21   liquidating the holdings, and as we've discussed,
22   the price can't go below zero.
23   These formulas do produce discounts in
24   excess of a hundred percent. That doesn't mean that
25   they are wrong. It just means that we have a case

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1 of extreme illiquidity where holdings are many
2 thousands of times daily trading volume, and thus,
3 in practice, the price would almost -- would most
4 likely quickly go to zero. That is what is being
5 captured by these very high liquidation discounts.
6   Q. Does the price go to zero on the first
7 token?
8   A. Not necessarily.
9   Q. What do you mean by that?
10   A. It is true that for the tokens at issue,
11 there's a positive market price, and presumably one
12 could sell one token at a positive price. From the
13 perspective of the value of the customer claims at
14 issue here for the debtor's holdings, the share of
15 tokens that could be sold at a positive price is so
16 small as to be negligible and could potentially
17 round to zero with a reasonable number of digits
18 after the decimal point. Therefore, I assign a
19 hundred percent discount.
20   Q. But it has a positive price, correct?
21   A. What is it?
22   Q. The token. The tokens here.
23   A. The tokens have a positive price.
24   Q. At what point how many tokens have to be
25 sold for the price to go to zero? For MAPS; let's

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1 be specific.
2   A. My estimates do not produce that number.
3   Q. What about for OXY?
4   A. Again, my estimates do not produce a
5 number of tokens that could be sold.
6   Q. A million tokens?
7   A. Again, I cannot speculate.
8   MR. GLUECKSTEIN: Object to the form.
9   A. I cannot speculate. However, I think it
10 would be reasonable to, in fact, suppose that it
11 would be difficult to find traders on the other side
12 of this liquidation process, once it's started, for
13 the at-issue tokens given the very large amount of
14 holdings to be sold.
15   So I think it -- although I have not done
16 this type of analysis, I would speculate that the
17 price would very quickly go to zero.
18   Q. How quick?
19   A. That, I cannot speculate on. It was
20 outside the scope of my analysis.
21   Q. Could you sell a million dollars worth of
22 MAPS before it goes to zero?
23   A. It would depend on market beliefs and
24 expectations.
25   Q. Could you sell $5 million worth of MAPS

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1 before it goes to zero?
2   A. Again, it would depend on market activity,
3 beliefs, and expectations.
4   Q. Could you sell $20 million before it goes
5 to zero of MAPS?
6   A. I would apply the same rule. And just to
7 illustrate why I believe market expectations are
8 important is that it would depend on, for example,
9 if the debtor announced that it's only selling 10
10 tokens and will destroy the remaining tokens, which
11 would be contrary, as I understand, to the
12 requirement as part of this bankruptcy proceedings
13 that all of the individual assets be liquidated,
14 regardless of the basis of the customer claims.
15   So in that case where, again, the debtor
16 has said we're going to sell 10 tokens and destroy
17 the remainder, one could imagine selling those 10
18 tokens at a positive price. That's common sense.
19   The analysis that I was asked to conduct
20 was to assess what would happen if the debtor
21 started to liquidate all of his holdings, and once
22 the market knows that the debtor is starting that
23 liquidation process, there would be an interplay
24 between that information and actual sales that would
25 determine when the price would go exactly to zero.

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1   Q. And that is some point after the tokens
2 start to be sold, is that correct?
3   A. I would expect so.
4   Q. So my question to you is with respect to
5 MAPS and OXY, at what point does the price go to
6 zero?
7   A. I cannot speculate, but my analysis
8 suggests that the overall proceeds to the estate
9 would be negligible and essentially rounding to zero
10 from the perspective of the large amount of holdings
11 of the debtor, around 400 million for OXY, a billion
12 for MAPS, and 3.7 billion for Serum.
13   Q. But it's not equal to zero, correct?
14   A. It's not exactly equal to zero.
15   Q. So again, my question is: Is it more or
16 less than $100 million?
17   A. I cannot speculate on specific amounts.
18   Q. More or less than $25 million for MAPS and
19 OXY each?
20   A. I have not done the analysis to speculate
21 on such amounts.
22   Q. What is a blockage model?
23   A. Can you elaborate?
24   Q. Well, that's what Mr. Konstantinidis calls
25 his model, right?

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1   A.   A block -- someone is selling blocks of
2 shares? Block trading?
3   Q.   Yeah. Sure.
4   A.   Yes. He assumes a gradual liquidation
5 process.
6   Q.   What's the difference between a blockage
7 model and a slow trading model?
8   A.   Mr. Konstantinidis assumes that each
9 customer could sell 10 percent of daily trading
10 volume every day indefinitely, so that means in the
11 case of MAPS and OXY that 20 percent and 30 percent
12 of daily trading volume are being sold every day
13 without any price impact.
14   And those 20 and 30 percent are blocks
15 that are sold each day, and selling sort of large
16 positions is often called a block trade, which is
17 sometimes split up into multiple orders.
18   The slow trading model that is assumed in
19 the Kyle and Obizhaeva method is the idea that
20 trading would take place at a natural speed
21 reflecting a market equilibrium outcome in which
22 traders wish to balance a desire for fast execution
23 with a desire to minimize transaction costs.
24   Q.   So are you familiar with the block -- a
25 blockage model?

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1   A.   If you're asking if I'm familiar with what
2 Mr. Konstantinidis does, I am.
3   Q.   Is that a recognized model for valuing an
4 asset or -- let me say it differently.
5   Is that a recognized model for estimating
6 an asset liquidation discount?
7   A.   I do not think that Mr. Konstantinidis'
8 assumptions are reasonable or supported by evidence.
9 It goes against common sense and basic financial
10 economics that one could sell 30 percent of daily
11 trading volume every day for years on end with no
12 price impact.
13   Q.   That wasn't my question. My question is:
14 Is the model recognized?
15   A.   As I understand, it is not conventional to
16 use a discount for lack of marketability to assess
17 price impact in liquidation, but I certainly cannot
18 exclude that market participants have done that in
19 the past.
20   Q.   In the KO model, are you aware of any --
21 let me ask it differently.
22   Are you aware of any authoritative method
23 for valuing the asset liquidation discount for
24 cryptocurrency?
25   MR. GLUECKSTEIN: Object to the form.

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1   Q.   (By Mr. Roselius) You can answer.
2   A.   I believe the KO model is the best
3 available alternative that has been validated in
4 digital asset markets.
5   Q.   And the validation is based on the
6 Brauneis paper?
7   A.   As well as my own analysis.
8   Q.   So you and Brauneis, is that correct?
9   A.   That is correct.
10   Q.   Has anyone else ever said it's an
11 authoritative method for valuing cryptocurrency?
12   A.   I think it's important to clarify that the
13 exercise is not to value the cryptocurrency, but
14 rather, to assess the likely price at which the
15 debtor could sell his holdings of cryptocurrency
16 which is a very similar question to what has been
17 asked in many markets selling and buying assets that
18 look broadly similar like equities, fixed income,
19 treasuries.
20   And so as with regards to the question
21 that we are asking, the KO model is well validated
22 in a range of settings that are having some
23 resemblance to our setting and is, therefore, the
24 most appropriate choice to answer the question at
25 hand.

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1   Q.   The Brauneis model examined only Bitcoin
2 and -- or BTC and ETH. Can we say it that way?
3   A.   Yes.
4   Q.   Did it examine any tokens like MAPS or OXY
5 or Serum?
6   A.   It did not examine MAPS, OXY, or Serum.
7   Q.   Did it examine any tokens like MAPS, OXY,
8 or Serum?
9   A.   In a sense as cryptocurrencies, BTC and
10 ETH are similar, and importantly, were traded on
11 exchanges as assets in a very similar way as MAPS,
12 OXY and Serum were traded on those exchanges such as
13 on FTX or Binance, and so I believe they are
14 relevant comparables for the purpose that we are
15 after here in calculating the asset liquidation
16 discount.
17   Q.   But the Brauneis paper did not examine any
18 tokens, correct?
19   A.   Correct.
20   Q.   In the Brauneis paper, they say that the
21 Kyle and Obizhaeva 2016 estimate performs rather
22 well in the low volume periods, but it's unable to
23 track liquidity across high volatility periods.
24   Are you estimating a low volatility
25 period -- a low volume period or a high volatility

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1 period in your opinion?
2   A.   You said a low volume period or a high --
3 you mean a low volatility period and a high
4 volatility period or low volume or high volume?
5   Q.   We'll come back to it. I may have written
6 it down wrong.
7   Would you agree that cryptocurrency in
8 general is highly volatile?
9   A.   Yes.
10   Q.   And that MAPS and OXY and Serum are highly
11 volatile?
12   A.   Yes.
13   Q.   So the quote is from Brauneis is that the
14 Kyle and Obizhaeva 2016 estimator performs rather
15 well in the low volume periods but is unable to
16 track liquidity across high volatility periods.
17   A.   So I chose an estimation period --
18   MR. GLUECKSTEIN: I'm sorry. Is there a
19 question? That's a quote.
20   Q.   (By Mr. Roselius) Can you explain that?
21   A.   It is natural for estimators to perform
22 better or worse across different ranges of these
23 measures.
24   Q.   And according to Brauneis, the KO 2016
25 model is unable to track liquidity across high

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1 volatility periods.
2   Do you agree with that?
3   A.   I'm not sure unable is the right way to
4 characterize this, but that is exactly why I chose
5 an estimation period of one year beginning on
6 November 2nd, 2021 and going to November 1st, 2022
7 to capture volatility and volume on a typical
8 trading day across market cycles and to avoid the
9 period of, you know, exceptional uncertainty that
10 preceded the petition time.
11   Q.   Do you agree with Brauneis that KO 2016
12 is, quote, unable to track liquidity across high
13 volatility periods, end quote?
14   A.   I don't think that that quote invalidates
15 the use of KO as the best available alternative for
16 these assets.
17   Q.   So Brauneis, which is the only thing other
18 than your opinion that applies the KO model to
19 cryptocurrency says it's unable to track liquidity
20 across high volatility periods, correct?
21   A.   So the fact that KO has been validated in
22 digital asset markets is not the sole basis for
23 using it in this exercise. Instead, it is KO's
24 assertion that they offer a universal formula of
25 market impact that applies across a range of

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1 different assets and markets that makes it the best
2 option here, and in practice, a more conservative
3 option than other approaches to these price
4 impact-based discount.
5   MR. ROSELIUS: Could you read back my
6 question?
7   (The preceding question was read back as
8 requested.)
9   Q.   (By Mr. Roselius) Could you answer my
10 question?
11   A.   It is correct that the paper states that.
12   Q.   And you relied on Brauneis -- the Brauneis
13 paper -- I'm not sure it's pronounced. Brauneis.
14 We'll go with that.
15   You relied on that to support your
16 opinion, is that correct?
17   A.   It is one of a number of reasons that I
18 used to support my choice of the KO model.
19   Q.   And --
20   A.   And to be clear, I don't -- I am not aware
21 of what Brauneis means exactly by high volatility,
22 but I expect that my approach of using a relatively
23 long estimation period ensures that idiosyncratic
24 events causing exceptionally high volatility do not
25 bias my estimates.

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1   Q.   Other than Kyle and Obizhaeva, has anyone
2 else said that the KO model applied universally?
3   MR. GLUECKSTEIN: Object to the form.
4   Q.   (By Mr. Roselius) You can answer.
5   A.   I do not know of any other sources, but
6 given that KO is peer reviewed in the top methods
7 journal in economics and finance, I trust that it is
8 an accurate statement.
9   Q.   No other source has described the KO model
10 as described -- as applying universally, correct?
11   MR. GLUECKSTEIN: Object to the form.
12   Q.   (By Mr. Roselius) You can answer.
13   A.   I don't know of any paper that has -- I
14 don't know whether any other paper has used the word
15 universal, off the top of my head, but it has been
16 cited and employed in other peer-reviewed literature
17 since it was published.
18   Q.   No other paper has said that it applies
19 universally, correct?
20   A.   I don't know. I have not read and recall
21 every single word from every paper that has ever
22 cited KO 2016.
23   Q.   You're not aware of any paper that has
24 ever said -- other than KO themselves that's ever
25 said it applies universally, correct?

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1   MR. GLUECKSTEIN: Object to the form.
2   Q.   (By Mr. Roselius) You can answer.
3   A.   I am not aware of any specific papers that
4   say that.
5   Q.   And in the Brauneis paper, they say,
6   quote, our results suggest that the measure used
7   should depend on the question being asked as there
8   is not, in parens, yet a universally best measure.
9   Do you agree with that?
10   A.   I believe that of the alternatives
11   available to me that the data that I had at hand,
12   and given the question, the KO model was the best
13   choice. Rarely in economic analysis do we have the
14   perfect -- like, the perfect estimator that would
15   provide exactly the best solution in a sort of
16   Panglossian best state of the world.
17   Q.   You agree that there is not a universally
18   best measure, correct?
19   MR. GLUECKSTEIN: Object to the form.
20   A.   Again, I think the KO model is the best
21   alternative that is available to conduct this
22   analysis.
23   Q.   (By Mr. Roselius) But there is no
24   universally best method, correct?
25   MR. GLUECKSTEIN: Object to the form.

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1   Q.   (By Mr. Roselius) You can answer.
2   A.   As far as I was concerned, with the models
3   that I knew about, it is the best in a universal
4   sense. I'm struggling here because it is, of
5   course, possible that future theorists will develop
6   a better model, but I did not have access to that
7   better model.
8   Q.   It's a yes or no question.
9   MR. GLUECKSTEIN: It's not a yes or no
10   question. She's answered the question five times.
11   She's not giving you the answer you want. You can
12   ask it again, and then we need to move on. You've
13   asked it five times.
14   Q.   (By Mr. Roselius) You're relying on
15   Brauneis, correct?
16   A.   I am not relying exclusively on Brauneis.
17   Even if we were to remove Brauneis from
18   consideration, I still believe that the KO model was
19   the best available alternative for estimating asset
20   liquidation discounts.
21   I believe the market structure of digital
22   asset markets as they existed at the petition date
23   bears enough resemblance to the markets that KO had
24   used to make it a reasonable application.
25   Q.   Was Brauneis looking at valuing individual

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1   digital assets or ranking exchanges?
2   A.   Do you have a copy of the Brauneis paper
3   that I can see so we can discuss it in more detail?
4   Q.   Are you not familiar with it?
5   A.   I am familiar with it, but I read it last
6   -- several months ago, and I do not wish to misstate
7   what they did exactly.
8   Q.   You didn't look at it before -- in
9   preparation for your deposition?
10   A.   I did briefly skim it, but I don't recall
11   the details. And so if we are going to discuss it
12   in depth, I would like to have a copy.
13   (Exhibit 3 was marked for identification.)
14   Q.   (By Mr. Roselius) You've been handed
15   what's been marked as Howell Exhibit 3 which is a
16   copy of the Brauneis paper.
17   A.   Correct.
18   Q.   So my question, Professor, was Brauneis
19   was ranking exchanges, not looking at individual
20   tokens, is that correct?
21   A.   I believe their analysis is of the
22   individual Bitcoin and Ether cryptocurrencies.
23   Q.   They were looking at ranking the
24   exchanges, not valuing tokens or estimating
25   liquidity -- estimating asset liquidation discounts?

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1   A.   Well, what is relevant to my citation of
2   this paper is that they employed the liquidity
3   measures and then ranked those liquidity measures
4   using different types of data and conclude that the
5   Kyle and Obizhaeva and Amihud 2002 illiquidity
6   ratios perform the best, you know, across most of
7   the dimensions that they consider. And I would
8   pinpoint out that Amihud 2002 model produces higher
9   discounts than the Kyle and Obizhaeva model in my
10   data.
11   Q.   That wasn't my question. They were
12   looking at ranking different exchanges, correct?
13   A.   Well, the abstract says this paper
14   investigates the efficacy of low frequency
15   transaction-based liquidity measures to describe
16   actual high-frequency liquidity.
17   There's some more text. The Kyle and
18   Obizhaeva 2016 estimator and the Amihud 2002
19   illiquidity ratio outperform when estimating
20   liquidity levels.
21   That is the reason that I cite this paper
22   as one among several reasons to use the KO model.
23   MR. ROSELIUS: Let's take five minutes.
24   (A break was taken.)
25   Q.   (By Mr. Roselius) So I want to direct your

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1 attention to page 13 of Brauneis' paper where they
2 talk about comparing the liquidity of different
3 trading venues.
4   Do you see that in Section 3.6?
5   A. Yes.
6   MR. ROSELIUS: Sorry. Can we go off the
7 record for a second?
8   (A discussion was held off the record.)
9   Q. (By Mr. Roselius) So they talk in Section
10 3.6 about ranking exchanges or comparing the
11 liquidity of different trading methods, correct?
12   A. Correct.
13   Q. And they say -- they talk about that by
14 chance, the fraction should be 50 percent. So
15 they're looking at ranking different exchange pairs
16 to see whether each liquidity proxy applies when
17 ranking the different exchanges?
18   A. Yes. That does seem to be this brief --
19 the analysis in this section.
20   Q. And at the bottom of page 14 in the first
21 column, they say, quoting, for the price impact on
22 the other hand, the percentage of matching rankings
23 is lower and is often post 50 percent even for the
24 best performing estimators. The liquidity proxies
25 thus do not provide valuable information on the

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1 ranking of price impacts across different trading
2 venues.
3   Do you know why the KO model was not able
4 to provide valuable information on the ranking of
5 price impacts across different trading venues?
6   A. I do not, and I don't think it's relevant
7 for my use of this paper in my report since I was
8 not using it to rank exchanges.
9   Q. Did you ever try to calculate the two
10 invariance in the KO model based on cryptocurrency
11 data?
12   A. I did test the invariance hypotheses in my
13 model -- in my data to the best extent possible and
14 found results to be broadly consistent, although the
15 data were noisy.
16   Q. What do you mean by broadly consistent?
17   A. So do you have a copy of the KO 2016
18 paper? I can show you the tables we replicated as
19 much as we could.
20   Q. Yeah.
21   (Exhibit 4 was marked for identification.)
22   Q. (By Mr. Roselius) So you've been handed
23 what's been marked as Exhibit 4, and that is a copy
24 of the 2016 KO paper, is that correct?
25   A. Correct.

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1   Q. You were referring to a table. Can you
2 tell me which table you were referring to, after you
3 find it?
4   A. I will. Table 1 on page 1369.
5   Q. And you tried to replicate that table; is
6 that what you said?
7   A. Yes. We show that these moments of volume
8 and volatility exhibit broadly similar patterns. In
9 particular, in Panel A where, for example, the --
10 going from the first decile in the second column to
11 the second decile in the top column, we see the
12 median volatility times price -- volume times price,
13 the average daily volume in millions increasing and
14 the volatility across those columns broadly
15 decreasing.
16   I cannot recall exactly the relationship
17 between our descriptive specifics and theirs, but I
18 do know that we confirmed a broadly similar pattern
19 in the cryptocurrency data as in these descriptive
20 statistics.
21   Q. And that's in your report?
22   A. We did not include it in the report.
23   Q. And why not?
24   A. And we cannot -- yeah. It was -- as I
25 mentioned, the data were noisy. I believe the tenth

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1 decile had relatively higher values compared to the
2 other deciles due to the higher volatility of these
3 assets, and we felt it was useful for us, in
4 validating our decision internally, to use the KO
5 model.
6   And I, in particular, have requested the
7 analysis to ensure that our data performed in a
8 roughly -- you know, roughly consistent with the
9 invariance hypotheses, and I was satisfied that it
10 did. I didn't feel it was important enough to
11 include in the report.
12   Q. You didn't think validating the model on
13 cryptocurrency was important to include in the
14 report?
15   MR. GLUECKSTEIN: Object to the form.
16   A. I see no reason why the model would not
17 apply to the digital asset markets as a general
18 matter, so it did not seem first order to include
19 these tests.
20   Q. (By Mr. Roselius) How do you identify bets
21 for the KO model?
22   A. I'm sorry. Can you clarify? Are you
23 asking what is a bet, or do I see bets in our data?
24   Q. Yeah. The latter. How did you identify
25 the bets to use in the KO model for this opinion?

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1   A. Yeah. So bet, in my report, is the
2   decision to sell the debtor's holdings of a given
3   digital asset. So a bet is a decision to implement
4   a trading idea, to take a long-term position in an
5   asset, and that is precisely what the debtor is
6   doing in deciding to sell its holdings of a digital
7   asset.
8   A bet may be implemented through multiple
9   trades. Similarly, the debtor is likely to
10 liquidate its holdings of digital assets across
11 multiple trades, and thus, they are analogous.
12   Q. So bets are -- but are bets different than
13 the individual transactions?
14   A. Yes. A bet is a decision to implement a
15 trading idea, to take a long-term position, and it
16 may be executed via multiple transactions.
17   Q. Are bets and transactions statistically
18 independent?
19   A. In what sense?
20   Q. Well, say you have multiple transactions
21 in a single day. Is that the same thing as a bet?
22   A. Not necessarily.
23   Q. How can you identify a bet based on
24 transaction data?
25   A. That was not within the scope of my

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1   analysis. KO used portfolio transitions data in
2   which they can observe bets as well as trading
3   outcomes in order to validate their theory.
4   Q. Because you can't see a bet in transaction
5   data. You have to be able to sort of see inside the
6   mind of the market participant?
7   A. Exactly.
8   Q. So how did you decide what the bet was
9   with respect to MAPS and OXY and Serum?
10   A. I was instructed that the debtor would be
11 liquidating all of its holdings of each digital
12 asset and thus, the size of the bet is the size of
13 the holdings.
14   Q. Do you think that's consistent with the KO
15 model's use of the portfolio data?
16   A. Yes.
17   Q. Why?
18   A. Because the asset managers in portfolio
19 transitions data are exiting and acquiring
20 positions, and that is exactly what the debtor is
21 doing.
22   Q. One of the bases for your opinion is the
23 daily trading volumes, is that correct?
24   A. Yes. I used data on daily trading
25 volumes.

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1   Q. How did you determine the daily trading
2   volume that you would use?
3   A. I used information from the Coin Metrics'
4   API on daily volumes as explained fully in the
5   appendix of my report.
6   Q. Why didn't you use the period that Mr. Lu
7   used in his opinion?
8   A. Mr. Lu was instructed to identify an
9   accurate petition time price, and he used a rigorous
10 method to identify an accurate snapshot of the price
11 as of the petition time. He chose ultimately a
12 60-minute intervals -- interval before the petition
13 time.
14   For estimating the KO model, one input is
15 price, and for the tokens at issue, I used the price
16 from the petition time provided by Mr. Lu. For
17 volume and volatility, I used the average of the
18 daily values for one year before November 2nd, 2022
19 because I am interested in a forward-looking
20 estimate of what a typical trading day would look
21 like.
22   And I felt that one year was an
23 appropriate balance of ensuring a long enough time
24 for idiosyncratic events not to bias the estimates
25 but also not going too far back in time such that

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1   for these relatively young projects, the information
2   would be stale.
3   Q. You specifically relied on Mr. Lu's
4   determination of which exchanges are trusted and
5   which are less reliable, is that correct?
6   A. Yes.
7   Q. Did you do any independent analysis to
8   determine whether any of the exchanges were trusted
9   or less reliable?
10   A. I also looked at CoinMarketCap's scores of
11 the trustworthiness of the exchanges that it covers.
12   Q. But you didn't use the CoinMarketCap data,
13 is that correct?
14   A. That is correct.
15   Q. Why not?
16   A. The incremental exchanges that appear on
17 CoinMarketCap and not in Coin Metrics have low trust
18 scores, according to CoinMarketCap. And my
19 assessment of the literature is that employing the
20 CoinMarketCap data would require also assessing
21 volume haircuts for wash trading which appears to be
22 70 to 80 percent of volume on those additional
23 exchanges.
24   Q. Is wash trading inconsistent with efforts
25 to limit float?

21 (Pages 78 to 81)

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1   A. Not necessarily.
2   Q. Why not?
3   A. Efforts to limit the float, which was, as
4 I understand, the strategy of Sam Bankman-Fried for
5 the at-issue tokens are designed to increase the
6 market price such that the fully diluted value of
7 all the tokens is higher, and locked up tokens, in
8 particular, could be used as collateral whereas wash
9 trading is a strategy in which market participants
10 buy and sell tokens without changing their risk
11 exposure in order to make volume appear larger than
12 it really is.
13   In the case of an exchange, it makes the
14 exchange appear to be a more attractive venue for
15 trading with more liquidity than it really has, or
16 in the case of a single token, to make that token
17 appear more widely used than it really is.
18   Q. Why did you decide to cut off -- you
19 mentioned the marginal exchanges. Why did you
20 decide to cut it off where you did?
21   A. I used volume from all of the exchanges in
22 the Coin Metrics universe except for three in which
23 Kevin Lu suggested there is a lower degree of trust
24 and I should exclude and where I also saw
25 unreasonable trading activity.

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1   Q. How did you decide the trading activity
2 was unreasonable?
3   A. I looked at graphs of the volume and
4 prices and saw very strange spikes that could not be
5 plausibly the result of regular course market
6 activity.
7   Q. Why not?
8   A. Because in my experience, volume doesn't
9 spike 10,000 percent on a given day for one day only
10 in the course of normal trading activity.
11   Q. What's the basis for that opinion?
12   A. My experience looking at market data for
13 cryptocurrencies and other assets.
14   Q. So you don't see any other situations
15 where there's increases in volume of that nature in
16 crypto markets?
17   A. There are certainly volume spikes, but I
18 did not see anything of the order of magnitude at
19 the other exchanges that I did on these three
20 exchanges.
21   Q. And you looked at all the other exchanges
22 when you did this analysis?
23   A. I did not personally see the volume graphs
24 for every exchange. I relied on Kevin Lu's
25 assessment that the other exchanges were

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1 trustworthy.
2   Q. So you didn't compare the exchanges that
3 were untrustworthy with the exchanges that are
4 trustworthy?
5   A. I believe that at my direction, the team
6 at Analysis Group has reviewed the volume data at
7 each exchange as part of aggregating them. I have
8 not personally seen the volume data from every
9 exchange.
10   Q. So you don't know if the other exchanges
11 had those kind of spikes?
12   MR. GLUECKSTEIN: Object to the form.
13   Q. (By Mr. Roselius) You can answer.
14   A. I believe I would know if they had because
15 the team, working under my direction at Analysis
16 Group, informed me of where they did see spikes and
17 showed me those data which I assessed to be
18 unreasonable. And I believe that my directions were
19 such that had they seen spikes at other exchanges, I
20 would also have been notified of that.
21   Q. But you didn't look at them yourself?
22   A. I did not.
23   Q. So you don't know whether there were other
24 spikes, correct?
25   MR. GLUECKSTEIN: Object to the form;

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1 misstates testimony.
2   Q. (By Mr. Roselius) You can answer.
3   A. I would expect that had I taken a very
4 close look at all of the exchanges and connected
5 them on an exchange-by-exchange basis to estimates
6 of wash trading in the literature that it would have
7 been reasonable to further either limit the number
8 of exchanges or apply haircuts to the volume
9 reported by the exchanges to try to further identify
10 only organic or legitimate volume.
11   Instead, I tried to take an inclusive
12 approach and simply used the Coin Metrics universe
13 to the greatest degree that seemed plausible.
14   Q. The analysis you just talked about, you
15 did not do that, correct?
16   A. Once again, I chose to use the Coin
17 Metrics universe upon the advice of Kevin Lu and the
18 Coin Metrics methodology. Kevin Lu alerted me to
19 three exchanges in his universe which are less
20 trustworthy.
21   I was also separately informed by the team
22 at Analysis Group of the unreasonable trading
23 activity at those exchanges and using those two
24 pieces of information decided to exclude them.
25   Q. Sorry. Which three exchanges did you say

22 (Pages 82 to 85)

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1 they were?
2   A. ZB which was hacked in 2022, and that
3 might explain some of the activity -- I am not
4 sure -- Local Bitcoins, and Lbank.
5   Q. How much of an effect would including
6 those exchanges have on your opinion?
7   A. I don't believe it would have a large
8 effect. As I recall sitting here, in a sensitivity
9 analysis in my rebuttal report, I include all volume
10 on the CoinMarketCap, Coin Paprika, and Coin Gecko
11 exchanges which includes the incremental exchanges
12 that Mr. Konstantinidis suggests be included and
13 find discounts of 100 percent for MAPS and OXY
14 across all three data aggregators and 42 to 64
15 percent for Serum, depending on the data aggregator.
16   Q. But that's not the actual discount that
17 the model returns, right?
18   A. Yeah.
19   Q. Because it's then manually adjusted to 100
20 percent?
21   A. Oh. For MAPS and OXY?
22   Q. Yeah.
23   A. Yes. I imagine the numbers above a
24 hundred percent are different, depending on the
25 volume inputted.

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1   Q. It's your opinion that the asset
2 liquidation discount and the discount for lack of
3 marketability can be applied together, correct?
4   A. Yes.
5   Q. As a two-step process where you first
6 apply the discount for lack of marketability and
7 then an asset liquidation discount, correct?
8   A. Correct.
9   Q. As part of that, you assume that all the
10 tokens are instantaneously unlocked as of the
11 valuation date, is that correct?
12   A. I understand that all of the tokens are
13 unlocked on the debtor side and can be liquidated
14 immediately.
15   Q. Because of something that happened in the
16 bankruptcy court, or why do you -- why do you assume
17 that?
18   A. Because that is what I have been told by
19 --
20   Q. Oh.
21   A. -- counsel acting on behalf of the debtor.
22   Q. Okay. Rather than assuming that the
23 tokens unlock according to the specific contracts in
24 terms of each token, relating to each token?
25   A. The customer claims are to assets with

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1 contractual marketability restrictions, and it is
2 well established that assets with marketability
3 restrictions are worth less than those without,
4 which Konstantinidis also presumes in his report.
5   And so it is appropriate to value those
6 claims subject to marketability restrictions at a
7 lower value than their identical counterparts that
8 were freely tradeable.
9   So I implement that adjustment via a
10 two-step process, as you described, where tokens are
11 first unlocked according to the specific vesting
12 schedule associated with that customer account or
13 that locked token, and then an asset liquidation
14 discount is applied as needed subsequently.
15   Q. But you don't actually apply a discount
16 for lack of marketability based on the vesting
17 schedule. You assume they all unlock as of the
18 petition date, correct?
19   A. No. My discount for lack of marketability
20 is calculated according to the specific vesting
21 schedule in each contract between the customer and
22 FTX.
23   Q. Why did you choose to use an options
24 pricing model based on Finnerty and Ghaidarov?
25   A. These papers employ the same underlying

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1 model in which the opportunity cost of a
2 marketability restriction is modeled as the value of
3 an Asian average strike put option. And I prefer
4 that model to alternatives such as the Chaffe model
5 that Mr. Konstantinidis employs because it doesn't
6 assume that investors can time the market.
7   Consistent with evidence about investor
8 behavior, it has investors selling essentially at
9 anytime or an average time during the
10 non-marketability period.
11   Both models also behave better at longer
12 horizons. It is important that a discount for lack
13 of marketability be increasing monotonically in the
14 length of the non-marketability period, and these
15 models accomplish that, unlike the Chaffe model used
16 by Mr. Konstantinidis.
17   Q. Mr. Konstantinidis also used the Finnerty
18 model, correct?
19   A. Correct.
20   Q. And you agree with his use of that model?
21   A. He used the closed form so approximation
22 that Finnerty provides, but for high volume --
23 sorry -- high volatility assets over
24 non-marketability periods of more than two or three
25 years, the Finnerty model -- the Finnerty

23 (Pages 86 to 89)

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 1   approximation does not perform well.
 2          It is capped at about 32 percent,
 3   suggesting that the asset that cannot be sold for
 4   five years has the same value as the identical asset
 5   that cannot be sold for three years which is not
 6   reasonable, in my view.
 7          Therefore, I employed a simulation-based
 8   implementation of the underlying model which does
 9   not have that undesirable feature.
10       Q.  So you're saying you use the same model
11   but implement it differently?
12       A.  Correct.
13       Q.  So you agree with the use of the model,
14   just not the --
15       A.  Yes.
16       Q.  -- implementation?
17       A.  Yes, though I would say that
18   Mr. Konstantinidis and I are using the same model
19   for sort of different -- different purposes.
20       Q.  Why did you choose -- what other models
21   did you consider besides Finnerty and Ghaidarov?
22       A.  I considered the Longstaff model and the
23   Chaffe model --
24       Q.  Why did you choose --
25       A.  -- and there may have been others, but I
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 1   -- if there were, I don't recall.
 2       Q.  Why did you choose not to use the
 3   Longstaff model?
 4       A.  I believe it provided unreasonably high
 5   discounts for lack of marketability given the high
 6   volatility of assets in our data, but I would have
 7   to return to my records to be sure.
 8       Q.  What do you mean by unreasonably high
 9   discounts?
10       A.  I don't recall the exact numbers, but I --
11   I do recall that some of the other -- that it
12   produced discounts that went to -- that were higher
13   than the version we chose in the end which was a
14   more conservative choice.
15       Q.  Were they discounts over 100 percent?
16       A.  I don't recall.
17       Q.  Is Ghaidarov known for overestimating
18   discounts for lack of marketability?
19       A.  Not to my knowledge.
20       Q.  Is Flagstaff?
21       A.  You mean Longstaff?
22       Q.  Longstaff.  Thank you.  Longstaff.
23       A.  I can't speculate on which of these models
24   are known to over- or underestimate.
25       Q.  Do you know if Longstaff has ever been
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 1   criticized for overestimating discounts?
 2       A.  I don't.
 3       Q.  Are you offering any opinion as to the
 4   specific fundamental value of MAPS or OXY or Serum?
 5       A.  I opine in my rebuttals that the
 6   fundamental value of these tokens, and especially
 7   Serum, is likely negligible as of the petition date
 8   given their close ties to FTX and Mr. Sam
 9   Bankman-Fried, but that is not part of my formula --
10   formal analysis or liquidation or marketability
11   discounts.
12       Q.  That's true only for OXY and Serum,
13   though, correct?  You don't mention the fundamental
14   value of MAPS.
15       A.  That's true.  I think that is because the
16   other two protocols are defunct and no long
17   operating, whereas my understanding is that while
18   the MAPS price has declined substantially since the
19   petition date, it may still be operating as an
20   underlying application.
21       Q.  Are you offering an opinion as to the
22   discount based on the connection between -- the
23   alleged connection between the tokens and FTX and
24   Sam Bankman-Fried?
25       A.  I am not.
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 1       Q.  Have you ever valued -- have you ever
 2   opined on the fundamental value of assets that are
 3   associated with an alleged or a convicted criminal?
 4       A.  Not before this case, no.
 5       Q.  What is your qualification to offer an
 6   opinion as to the fundamental value of assets
 7   connected to a convicted criminal?
 8       A.  I think my research for the ICO paper is
 9   directly relevant to this question of the
10   fundamental value of FTT, Serum, and then perhaps to
11   a slightly lesser degree, OXY and MAPS, and that is
12   because these token projects relied on the support
13   and prestige of a key individual.
14          And characteristics of such project
15   leaders was, in fact, a point of analysis in the ICO
16   paper, that the -- when you have a utility token
17   whose value is determined by its usefulness on a
18   blockchain-based platform or project, factors that
19   determine the performance and success of those
20   projects are directly related to the value of the
21   token which is essentially the key insight of the
22   ICO paper.  Furthermore, FTX hosted the MAPS ICO
23   which, you know, further connected the two.
24       Q.  But the ICO paper doesn't provide any
25   valuation model, right?
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24 (Pages 90 to 93)

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1   A. It does not, but it does discuss where
2 utility value of tokens comes from. And in the case
3 of the at-issue tokens, the value came in
4 substantial part from the material and intangible
5 support of FTX, Alameda, and Sam Bankman-Fried.
6   On the material side we have, for example,
7 a $50 million investment from Alameda into MAPS and
8 a $40 million investment from Alameda into OXY.
9   Q. How is any of that incorporated into your
10 asset liquidation discount model?
11   A. My asset liquidation discount model does
12 not include any assessment of fundamental value.
13 However, the use of the debtor holdings in the
14 calculation incorporates the risks that customers
15 took in holding these tokens that had a great deal
16 of FTX-specific liquidity and managerial risk.
17   And I believe that those risks, when they
18 have costs, the costs should be borne by those
19 customers who have assumed those risks and not by
20 other customers who are holding tokens whose value
21 did not depend on FTX holdings and managerial
22 decisions in the same way.
23   Q. You're offering that as an opinion in this
24 case?
25   A. Sorry. That was a bit long, but I think

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1 the tie between the at-issue tokens and FTX makes it
2 especially appropriate to use the debtor holdings as
3 the input to the asset liquidation discount.
4   And so in that way, the discount to some
5 degree, albeit not fully, incorporates these
6 FTX-specific risks that customers were taking on
7 when they invested in the at-issue tokens.
8   Q. But that's not at all incorporated in your
9 model, correct?
10   A. Well, the model is agnostic -- or I'm
11 sorry. I don't know if that's the right word. The
12 model is agnostic about these questions of project
13 dependence on FTX. It only incorporates it insofar
14 as the debtor's holdings are 95 to 99.8 percent of
15 total token volume.
16   That means that the holdings relative to
17 daily trading volume that get inputted into the KO
18 volume are very, very large and produce large
19 liquidation discounts, so it is essentially a
20 mechanical connection.
21   Q. So if you took SBF out of the case
22 entirely, assume that there's no criminal aspect to
23 it, how does that change the asset liquidation
24 discount?
25   A. Not at all.

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1   Q. Would you agree that Crypto News is a
2 reputable source?
3   A. I'm not aware of CryptoNews.
4   Q. Do you have your rebuttal report in front
5 of you? I think it was Exhibit 2. If you go to
6 footnote 75 on page 21, you relied on a CryptoNews
7 article, is that correct?
8   A. Yes.
9   Q. So you must think it has some reliability,
10 right?
11   A. Yes. I use a large number of
12 cryptocurrency information sources over the course
13 of all of these three reports, and I cannot
14 necessarily recall every one of them off the top of
15 my head.
16   (Exhibit 5 was marked for identification.)
17   Q. (By Mr. Roselius) I'm handing you what's
18 marked as Exhibit 5 which is an article from crypto
19 news entitled: Sam Coins Rally Ahead of Potential
20 March Trial, FTX Reboot.
21   Have you ever seen this article before?
22   A. I -- I may have. I've certainly read
23 similar articles, if I have not seen exactly this
24 one. Yes. I think I did -- yes. I think I did see
25 it.

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1   Q. In the article it states, quote, a number
2 of coins bankrolled by recently convicted FTX
3 founder Sam Bankman-Fried, appropriately dubbed,
4 quote, Sam coins, unquote, have continued to rally
5 this week ahead of his potential March trial. With
6 FTT up 200 percent, all coins such as Serum, MAPS,
7 and Oxygen have also outshined this week with the
8 total crypto market capitalization at a 14-month
9 high, end quote.
10   Do you know why MAPS, OXY, and Serum were
11 rallying after Sam Bankman-Fried was convicted?
12   A. I cannot speculate on that.
13   Q. Are you opining that MAPS or OXY or Serum
14 have a zero value because of their association with
15 Sam Bankman-Fried?
16   A. I believe that Serum and Oxygen have
17 negligble fundamental value because their
18 respective projects are defunct, and there is no
19 obvious means for the tokens to accrue value in the
20 future --
21   Q. Other than --
22   A. -- and the reason that their projects are
23 defunct seems connected to the downfall of Sam
24 Bankman-Fried.
25   Q. Other than potentially speculative value?

25 (Pages 94 to 97)

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1   A. Correct.
2   Q. Are you opining that MAPS or OXY have a
3 zero value because of limited float, a zero value,
4 in your opinion for the liquidation analysis because
5 of the limited free float?
6   A. No.
7   Q. MAPS and OXY and Serum are all trading
8 today, is that correct?
9   A. Yes.
10   Q. At a price above zero?
11   A. Yes.
12   Q. You state that over 95 percent of the
13 maximum supply of each of the at-issue tokens were
14 in the possession of FTX and Alameda.
15   What's the basis for that statement?
16   A. I believe the number is 95 percent for
17 Serum, between 97 and 98 percent for OXY, and 99.8
18 percent for MAPS, and the basis for that opinion is
19 information about the debtor holdings combined with
20 information about total supply.
21   Q. Where did you get that information?
22   A. I believe for the at-issue tokens,
23 Analysis Group researched reports of total supply on
24 a token-by-token basis.
25   Q. Did you consider the percentage of

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1 holdings of maximum supply for other tokens other
2 than Serum and MAPS and OXY in developing your
3 opinion as to value?
4   A. For these rebuttal reports, I was only
5 concerned with the at-issue tokens.
6   Q. So you didn't look at it or any other
7 tokens. Is that accurate?
8   A. No. We did calculate holdings relative to
9 token supply for many of the assets early on in the
10 process but did not include that in the report.
11   Q. Why not?
12   A. It's not directly relevant to the
13 discount.
14   Q. Is it indirectly relevant? I mean, you
15 said directly relevant. I just want to make sure I
16 understand.
17   A. It is indirectly relevant because when the
18 debtor -- debtor's holdings that need to be
19 liquidated as part of this bankruptcy process are a
20 very large share of all available tokens, it
21 necessarily implies that liquidity in the markets
22 will be more limited relative to cases where the
23 debtor is a small holder relative to other holdings,
24 and a key input in the KO model is holdings -- the
25 ratio of holdings to daily trading volume.

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1   Q. At what percentage of the maximum supply
2 does the discount go over 100 percent?
3   A. For the at-issue tokens, I believe it's 3
4 to 11 percent.
5   Q. So --
6   A. I believe from -- yeah. I'm not sure
7 which -- which token exactly is which, but I -- but
8 for sure, it's 11 percent for Serum and under 10
9 percent for MAPS and OXY. But you'd have to have
10 less than 3 percent of tokens supplied before, you
11 know, in order to have discounts of less than a
12 hundred percent.
13   Q. What percentage of the maximum supply of
14 Solana was in possession of FTX or Alameda or maybe
15 SOL, I should say?
16   A. I don't know off the top of my head.
17   Q. What percentage of the maximum supply of
18 Solana or SOL was in possession of FTX and Alameda?
19   A. I don't know off the top of my head.
20   MR. ROSELIUS: Can we take five minutes?
21   (A break was taken.)
22   Q. (By Mr. Roselius) Just before we broke,
23 you were talking about the 3 to 11 percent. I just
24 wanted to understand was that customers if it held
25 more than 3 to 11 percent or less than 3 to 11

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1 percent?
2   A. I think the position size sold for the
3 at-issue tokens in my method would have to be less
4 than 3 to 11 percent of total token supplied in
5 order to get under a hundred percent asset
6 liquidation discount.
7   MR. ROSELIUS: I'm going to reserve the
8 rest of my time, whatever there is. I'll pass it
9 off to guys down at the end of the table.
10   EXAMINATION
11 BY MR. BACON:
12   Q. I'm Elliott Bacon on behalf of TMSI, so
13 I'm going to try to avoid what we've covered. Same
14 ground rules as applied previously.
15   Do you have any questions about any of
16 that?
17   A. No.
18   Q. Okay. Are you offering an opinion on the
19 fundamental value of Serum?
20   A. In my rebuttal report, I opined that the
21 fundamental value of Serum was likely negligible as
22 of the petition date because of the token's
23 dependence on FTX and Sam Bankman-Fried who had
24 created it and controlled the Serum protocol.
25   Q. Did you say you're opining -- you're

26 (Pages 98 to 101)

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1   offering an opinion on it, or are you doing
2   something else? Is that different than your asset
3   liquidation discount?
4   A.   It is different.
5   Q.   Okay.
6   A.   For my formal asset liquidation discount,
7   I take what for Serum I believe is a very
8   conservative approach of applying the KO method in
9   the same way as for all of the other digital assets
10 I considered which yielded a 58 percent asset
11 liquidation discount.
12   But in addressing Mr. Gkatzimas' points
13 about future volume and the appropriateness of using
14 the debtor holdings to calculate that discount, I
15 opined that my discount is conservative given the
16 connection of this token to FTX and the fact that
17 that connection implied its value was likely
18 negligible as of the petition date.
19   Q.   And is that opinion on the fundamental
20 value -- I'm going to call it opinion so we don't
21 parse words -- based on post-petition events?
22   A.   It would have been reasonable at the
23 petition date to assume that the collapse of FTX and
24 the required liquidation of the debtor's holdings of
25 Serum would negatively impact the project and its

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1   token, so it would have been reasonable at the
2   petition date to conclude that the fundamental value
3   of Serum was negligible. I also use ex-post events
4   to point out that they are consistent with such an
5   opinion at the petition time.
6   Q.   And when you say reasonable, reasonable by
7   whom to assume?
8   A.   I think it was -- would be reasonable.
9   Q.   Based on pre-petition information?
10   A.   I think it would have been reasonable
11 based on pre-petition information, and I in my
12 rebuttal use post-petition information to validate
13 that argument.
14   Q.   But post-petition information does not
15 exist at the time of the petition?
16   A.   Correct.
17   Q.   So when you're saying it's reasonable at
18 the time of the petition, that is based on
19 pre-petition information; putting it in your
20 validation later?
21   A.   Yes.
22   Q.   And if it was reasonable to assume then,
23 would other markets also be able to make that
24 reasonable assumption?
25   A.   Can you restate the question?

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1   Q.   Yeah. So you said it was reasonable for
2   you to assume that based on pre-petition
3   information, correct?
4   A.   Yes.
5   Q.   And would it be reasonable for other
6   market participants to likewise make that
7   assumption?
8   A.   I think it would have been reasonable,
9   though I cannot say whether they did or not.
10   Q.   If it was reasonable -- if you think it
11 was reasonable to at least make that assumption,
12 would that information have been reflected in the
13 petition time price of Serum?
14   A.   Yes. I think a negative view of the
15 future of Serum was reflected in the large decline
16 in the token's price in the weeks and months leading
17 up to the petition time.
18   Q.   So you're talking about, like, November
19 2nd when the Coin Desk article comes out, right?
20   A.   Yes. I don't recall the exact numbers,
21 but I believe the token's value on the petition --
22 at the petition time was 37 cents, and I believe
23 something like a year earlier, it was at $17.
24   So I -- I may not have these numbers
25 exactly correct, but there was a -- a big decline

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1   over a -- over a period, and that certainly
2   continued and was likely elevated after the Coin
3   Desk article.
4   Q.   And do you recall whether the price
5   continued to drop after the Coin Desk article?
6   A.   Yes, it did. A year after the petition
7   time, the price of Serum was just 6 cents.
8   Q.   Sorry. Between the Coin Desk article and
9   the petition time, do you recall if the price
10 continued to drop?
11   A.   We can look at Figure 4 of my rebuttal in
12 order to ascertain exactly the pattern of decline.
13 I apologize. I made a mistake. I'm talking about
14 Figure 4 in the rebuttal that's Exhibit 2.
15   Q.   Can you read the title of the document?
16   A.   Rebuttal Expert Report of Sabrina T.
17 Howell, February 9th, 2024.
18   MR. GLUECKSTEIN: This is the exhibit
19 that's been marked as Exhibit 2 today that she's
20 referring to.
21   Q.   (By Mr. Bacon) I don't believe I have a
22 copy of the document up here. Is it something like
23 73 to 37 cents over that time period, looking at the
24 squiggly lines?
25   A.   I would say it's closer to 80 cents to 37

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1   cents.
2   Q.   In any event, there's a price drop between
3   the time that that article --
4   A.   Yes. It had this decline.
5   Q.   And I just want to make sure I've got the
6   underlying methodology correct, so let me just walk
7   through it on the KO model, okay, and I'm not
8   focused on the DLOM; just on the ALD.
9   A.   Okay.
10   Q.   And so is it correct that you received an
11 instruction to estimate the value of customer claims
12 based on the effect of liquidating the debtor's
13 holdings?
14   A.   Yes.
15   Q.   And so you plugged in the debtor's
16 holdings for each particular token that the debtor
17 held into the KO model?
18   A.   Yes.
19   Q.   And that's one of the four inputs into the
20 KO model?
21   A.   Yes.
22   Q.   And so, for instance, if -- assuming a
23 hypothetical token, the debtor held 1,000 of that
24 hypothetical token, you plugged in 1,000, it would
25 spit out a discount number, and the customer would

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1   get that discount multiplied by the petition time
2   price?
3   A.   That's correct.
4   Q.   And if you -- if the debtor held 1,000 of
5   the token and the customer held -- the customer
6   claimed 3,000 of that same token, the same 1,000
7   price discount would be applied to the 3,000 coins.
8   Do I have that right?
9   A.   That's correct.
10   Q.   And if the customer held 1,000 of the
11 token and the debtor held zero of the token, there
12 would be no discount applied to the customer claim?
13   A.   I believe that there were only a handful
14 of assets in that situation.
15   Q.   Just under the methodology.
16   A.   Yes.
17   Q.   And so you did not make any adjustments to
18 the model to account for differences between
19 customer holdings and debtor holdings?
20   A.   No.
21   Q.   You did make adjustments to account for
22 customer holdings, though, for the -- for the DLOM,
23 right?
24   A.   That's correct, to account for contractual
25 restrictions on marketability of those claims.

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1   Q.   But you chose not to make an adjustment
2   for the quantity of the customer holdings?
3   A.   I believe that it would be problematic to
4   take any approach besides using the debtor holdings
5   to determine liquidation discounts.
6   Q.   And that's because of the instruction you
7   were given?
8   A.   No. It's because if you use customer
9   claim amounts as Mr. Gkatzimas did, then either the
10 debtor does not liquidate the remaining holdings
11 after first liquidating customer claims, or the
12 debtor first liquidates assets to satisfy customer
13 claim amounts and then liquidates the remaining
14 holdings.
15   My understanding from counsel is that the
16 first option is impossible because the debtor is
17 required to liquidate all of its holdings of digital
18 assets, regardless of whether they are the basis of
19 customer claims.
20   The second option is also problematic,
21 though, for reasons that are a little bit more
22 complicated. If the customer claims amounts that
23 the debtor held in sufficient quantities were
24 liquidated first to satisfy those claims, there
25 would be a large shortfall in liquidation proceeds

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1   to satisfy the remaining customer claims to assets
2   that the debtor was not holding in sufficient
3   quantities, and those remaining claims are to assets
4   that are, in general, more liquid than the at-issue
5   tokens and less tied to FTX.
6   And so the creditors who would be harmed
7   by this strategy would be those holding more liquid
8   tokens that were less tied to FTX, while the
9   creditors who would benefit would be those holding
10 the less liquid tokens that were dependent on FTX.
11   And it is my view that the creditors who
12 assumed these FTX-specific risks should bear the
13 burden of those liquidation costs and not the
14 creditors who are holding more liquid and
15 widely-held assets.
16   Q.   Are you offering an opinion about which
17 customers are more worthy to receive the benefits of
18 the liquidation of the debtor's estate?
19   A.   I think it's reasonable that creditors
20 should bear the costs of the risks that they assumed
21 when they decided which types of digital assets to
22 hold, and a customer choosing to hold Serum rather
23 than Bitcoin was taking on two types of additional
24 risks beyond simply the FTX exchange functioning.
25   The first risk is that because the debtor

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1   held -- or FTX held 95 percent of all tokens
2   supplied, it could choose to or be compelled at any
3   time to liquidate its holdings and crash the price.
4   And second, because Serum was created by
5   and depended on Sam Bankman-Fried and FTX, an
6   investor was essentially betting on those entities'
7   continued ability to support the project. And as
8   part of these bankruptcy proceedings, I think it is
9   reasonable for investors to bear the cost of those
10   ex-ante risks that they had assumed.
11   Q.   It's fair for those investors to bear
12   those risks?
13   A.   As an economist, I don't opine on
14   fairness, but in general, I think I'm -- it is
15   appropriate to assign -- to assign risk to the
16   market participant who took that risk.
17   Q.   What's the difference between
18   reasonableness and fairness, in your opinion?
19   A.   I think the word fair has a normative
20   implication that suggests a welfare assessment which
21   is beyond the scope of my analysis.
22   Q.   So what's a reasonable amount of time?
23   A.   I think in -- I think -- I don't really
24   have more to say beyond that. I think in a context
25   where there is an imbalance in the composition of

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1   assets between customer claims and the debtor that
2   assigning risks -- the cost of risks to those who
3   assumed the risks ex-ante is -- was the most
4   economically appropriate decision to make, and I
5   don't have a view on what would be fair or unfair --
6   Q.   So --
7   A.   -- in a welfare sense.
8   Q.   -- as an economist, you made a decision
9   about who should bear the risk of a shortfall?
10   MR. GLUECKSTEIN: Object to the form.
11   A.   In the asset liquidation discounts that I
12   calculate and that I have put forward as 58 percent
13   for Serum, which I think is a very conservative
14   estimate, the only input that matters for this
15   discussion is the amount of debtor holdings relative
16   to daily trading volume which is a method that I
17   applied across all digital assets equally.
18   Q.   And you think it was reasonable to use
19   debtor holdings?
20   A.   I do.
21   Q.   But that was also an explicit instruction
22   from counsel, correct?
23   A.   Yes. It was part of my assignment, and I
24   think it was a reasonable assignment.
25   Q.   It's paragraph 4 of your original opinion?

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1   A.   That's correct.
2   Q.   And assuming that there is an FTX-specific
3   risk, did you perform any analysis to determine
4   whether that risk, that ex-ante risk that you
5   discuss was priced into Serum already?
6   A.   I do not think it was fully incorporated
7   since the price continued to decline after the
8   petition date, but it was certainly to some degree
9   incorporated, given the previous steep decline.
10   Q.   And my question was did you perform any
11   analysis to determine whether that FTX-specific risk
12   was incorporated into the Serum price?
13   A.   No.
14   Q.   Give me one second. I'm going to try to
15   skip a bunch of what happened earlier.
16   I'm sorry; what time do you have to break?
17   A.   At 1.
18   Q.   And is the FTX-specific risk incorporated
19   into the KO methodology at all?
20   A.   No.
21   Q.   Did you determine whether there was
22   FTX-specific risk for anything other than the
23   at-issue tokens we've been discussing today?
24   A.   Yes. It was part of my opinion on FTT.
25   Q.   Yeah. Sorry. Putting aside FTT or FTX

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1   equity, other than those two.
2   A.   No. I've just mentioned that for OXY and
3   Serum.
4   Q.   Did you perform any analysis as to what
5   impact there would be to the KO model to include
6   perpetual futures volume?
7   A.   I did not.
8   Q.   Did you make a determination one way or
9   another to include perpetual futures volume?
10   A.   I did not include perpetual futures
11   volume.
12   Q.   Why did you not include perpetual futures
13   volume?
14   A.   Because in perpetual futures markets, the
15   underlying asset never changes hands, so perpetual
16   futures are not a means for the debtor to sell the
17   Serum on its books.
18   Furthermore, trading in perpetual futures
19   markets would require the estate to post collateral
20   on third-party exchanges, thus tying up estate funds
21   and exposing the estate to third-party risk. It
22   would also create indefinite exposure as long as the
23   positions in futures markets were maintained which
24   is contrary to a timely resolution of the
25   bankruptcy.

29 (Pages 110 to 113)

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1   And finally, most importantly, it would
2   not result in any current or expected proceeds for
3   the estate, so there's no reason to include
4   perpetual futures volume in considering liquidating
5   these assets.
6   Q. So I'm going to try to go through those
7   one at a time.
8   A. Okay.
9   Q. Let's start from the top. You have a
10   baseline opinion that you cannot use perpetual
11   futures to liquidate digital asset holdings; that's
12   correct?
13   A. You cannot sell underlying digital assets
14   into perpetual futures markets, correct.
15   Q. And that opinion is based on the
16   underlying deliverable of the futures contract, that
17   it's cash or fiat or stable coin as supposed to
18   selling the underlying digital asset?
19   A. That's right.
20   Q. So can you use perpetual futures as part
21   of a strategy to liquidate a spot holding?
22   A. You can use perpetual futures markets in
23   theory to hedge, but you cannot use them to
24   liquidate holdings of digital assets.
25   Q. In theory and in practice, right?

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1   A. Not in practice because within five days
2   of the petition date, 99 percent of perpetual
3   futures volume for Serum had been delisted. And so
4   there was no perpetual futures volume in practice,
5   but in theory, yes, one can use perpetual futures to
6   hedge against price changes.
7   Q. Post-petition volume has no bearing on
8   your methodology, correct?
9   A. That's correct.
10   Q. How in theory would you use perpetual
11   futures to hedge a spot position?
12   A. That was outside the scope of my analysis.
13   Q. Do you have any opinion?
14   A. If you can ask a more specific question.
15   Q. Do you have any opinion on how to do that,
16   sitting here today?
17   A. I know it is possible for trading firms to
18   hedge risk exposure using perpetual futures markets.
19   I do not believe that is relevant for the debtor
20   situation not being a hedge fund.
21   Q. Do you know how the debtors are
22   liquidating assets?
23   A. I believe that the court has permitted the
24   debtors to make limited amounts of sales of the
25   digital assets in their holdings.

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1   Q. Are the debtors being assisted by anyone
2   in doing that?
3   A. I believe they're working with a firm
4   called Galaxy.
5   Q. Is Galaxy a trading firm?
6   A. I believe that Galaxy is conducting
7   operations that are very limited in scope at the
8   court's direction, and its other activities are not
9   relevant for its sales on behalf of the debtor.
10   Q. Do you think Galaxy is using its expertise
11   as a trading firm to liquidate the debtor's assets?
12   A. My understanding is that the debtor, and
13   therefore, its designated trading partner is not
14   permitted to increase exposure to digital asset
15   markets by, for example, acquiring positions in
16   perpetual futures.
17   Q. What is the increased exposure?
18   A. If the debtor were to take a short
19   position in perpetual futures markets as
20   Mr. Gkatzimas suggests, it would be increasing its
21   exposure to digital asset derivatives.
22   Q. It would be hedging its exposure to its
23   spot positions, right?
24   A. That depends on the particulars of the
25   debtor's trading strategy which I have not been made

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1   aware of. And to illustrate that, it may be that
2   the traders at Galaxy have decided that it is
3   impossible to liquidate any meaningful amount of
4   Serum and that they are just going to write it off.
5   In that case, they would not be selling
6   any Serum, and it would be -- it would be increasing
7   net exposure to Serum to trade in perpetual futures
8   markets. Though, again, there are no perpetual
9   futures markets today for Serum, as far as I
10   understand, so this strategy is not actually
11   available to Galaxy.
12   Q. But your methodology does not take into
13   account the post-petition market structure, correct?
14   A. That's correct. I think it's one reason
15   that the discount that is calculated is only 58
16   percent.
17   Q. Did you look at what the volume of the
18   perpetual futures markets for Serum was between the
19   petition date and five days after?
20   A. I don't recall. You mean between the
21   petition date and five days after?
22   Q. Do you know what the volume of the
23   perpetual futures market was?
24   A. I don't recall exactly, but I -- it may be
25   in Mr. Gkatzimas' report.

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1   Q. It's not relative to your methodology,
2 though, either way?
3   A. Correct.
4   Q. And whether perpetual futures continue to
5 trade Serum today is not relevant to your
6 methodology, right?
7   A. That's correct.
8   Q. Have you ever engaged in a liquidation of
9 a portfolio using futures?
10   A. No.
11   Q. Have you ever analyzed that or assessed
12 how that would be done?
13   A. Yes. I studied how firms hedge price risk
14 in futures markets in my research paper published in
15 the Journal of Corporate Finance.
16   Q. Outside of that paper, is there anything
17 else in your professional or academic background
18 relating to the trading of futures?
19   A. No.
20   MR. BACON: I'm going to get into
21 something that's going to take more than four
22 minutes, so maybe --
23   MR. GLUECKSTEIN: We should probably just
24 break here, then.
25   (A lunch break was taken.)

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1   Q. (By Mr. Bacon) Welcome back. Just so you
2 know, you understand you're still under oath.
3   A. I do.
4   Q. So let me try to pick up where we left off
5 before the break.
6   So one of the critiques of using perpetual
7 futures that you talk about in your rebuttal report
8 is it would run counter to the goal of liquidating
9 the estate, is that right?
10   A. That's right.
11   Q. And what is the goal of liquidating the
12 estate?
13   A. As I understand, the debtor is required to
14 liquidate all of its holdings of digital assets in
15 order to make distributions in US dollars to
16 creditors.
17   Q. Is the goal of liquidating the estate to
18 maximize those values of the debtor's assets while
19 doing that?
20   A. That was outside the scope of my
21 assignment.
22   Q. So no opinion one way or the other on
23 whether the goal of the estate is to maximize the
24 value of the estate?
25   A. I have not been informed about whether

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1 there are tradeoffs between execution time and
2 value, for example.
3   Q. Another critique in your report is that I
4 think unlike spot tokens, that with perpetual
5 futures, there needs to be a transfer of collateral
6 to the third-party exchanges, is that correct?
7   A. That's correct.
8   Q. Have you performed any analysis of the
9 cost of that collateral transfer?
10   A. I have not, but given the size of the
11 estate's Serum position, I believe it would be a
12 material amount of collateral --
13   Q. That --
14   A. -- in the sense that it would tie up
15 meaningful amounts of estate funds.
16   Q. That would depend on how much Serum was
17 liquidated through the perpetual futures market as
18 opposed to the spot market, right?
19   A. I do not believe you can liquidate Serum
20 through the perpetual futures market.
21   Q. As part as a trading strategy involving
22 the perpetual futures market?
23   A. If the estate were to take a short
24 position in perpetual futures markets, then they
25 would have to post collateral in margin accounts at

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1 third-party exchanges.
2   Q. Right. And the amount of collateral that
3 is posted would depend on the size of that short
4 position?
5   A. That's right.
6   Q. So smaller short position, less
7 collateral; bigger short position, more collateral?
8   A. Yes.
9   Q. Other than what you just told me, you
10 haven't performed any quantitative analysis of that
11 collateral cost?
12   A. I have not.
13   Q. You do not know one way or the other
14 whether accessing the perpetual futures market would
15 outweigh -- sorry. Scratch that.
16   You don't know one way or the other
17 whether the cost associated with that collateral
18 transfer would be outweighed by the benefits of
19 accessing the perpetual futures market?
20   A. I do not believe there are any benefits to
21 accessing the perpetual futures market as part of
22 liquidating the estate's holdings of Serum.
23   Q. Are you aware that you can trade perpetual
24 futures on leverage?
25   A. Yes.

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1   Q. And trading perpetual futures on leverage
2   requires less collateral than trading perpetual
3   futures not using leverage, is that right?
4   A. That's correct, though it is also a
5   riskier strategy.
6   Q. It's a riskier strategy and has greater
7   potential benefits as well, right?
8   A. I'm sorry? It has greater --
9   Q. It's a riskier strategy and then likewise
10 has greater potential benefits, right?
11   A. Yes.
12   Q. And then in your report as well, in your
13 rebuttal report, you also talk about some of just
14 the risks of trading perpetual futures like trading
15 -- like an exchange might go bankrupt, right?
16 Things like that.
17   Have you performed any quantitative
18 analysis of the cost of those risks?
19   A. I have not, although you can see in one of
20 the figures in the rebuttal report that FTX itself
21 accounted for 20 percent of perpetual futures volume
22 in Serum, and that illustrates the significant risk
23 of these markets since, of course, FTX collapsed and
24 thus, holders of perpetual futures contracts were
25 exposed to that risk ex-ante.

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1   Moreover, perpetual futures can be
2   delisted and are delisted. And so for the estate to
3   try to take an indefinite position in those markets
4   would face the additional risk that an ongoing
5   exchange would delist the futures.
6   Q. Did holders of perpetual futures, under
7   your methodology, receive any asset liquidation
8   discount?
9   A. Because the futures positions were fiat
10 denominated contracts between the customer and FTX
11 that were market-to-market every 30 seconds, there
12 is nothing for the estate to liquidate associated
13 with those positions, and the fiat-denominated P&L
14 accurately represents the value of those positions
15 at the petition time. So that account level P&L is
16 what I used as the value of the customer claims.
17   Q. So under your methodology, if it were to
18 be applied by another bankrupt exchange, the holders
19 of perpetual futures would come out better than the
20 holders of the spot futures?
21   A. It would depend on the position that they
22 had.
23   Q. They would come out at least as well
24 because they would have a zero percent ALD, and the
25 best a holder with spot checking could do is a zero

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1   percent ALD?
2   A. I don't know that they are really
3   comparable in that, for example, a holder of a given
4   futures position might have believed that prices
5   would, you know, in the future move in her favor had
6   things not been frozen at the petition time, and
7   thus, might believe that they were in a
8   disadvantaged position than someone receiving a spot
9   price or vice versa, so I really can't -- I can't
10 really compare those two types of claims.
11   Q. Is anything in your methodology dependent
12 upon the subjective belief of customers?
13   A. No.
14   Q. Do you have any opinion on the size of the
15 perpetual futures market in Serum to -- as compared
16 to the spot market during the estimation period?
17   A. I saw the numbers in Mr. Gkatzimas'
18 report, but otherwise, I'm not aware of those
19 volumes as they were not part of my analysis.
20   Q. So we just talked about a few risk
21 factors, and I think those risk factors you
22 identified in your report were based on the debtor
23 liquidating the estate, right; the risks to the
24 debtor of liquidating an estate by accessing the
25 perpetual futures market, is that right?

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1   MR. GLUECKSTEIN: Object to the form.
2   You can answer.
3   A. I discussed in my rebuttal report risks to
4   the debtor of taking on short positions in perpetual
5   futures markets, but I disagree with the presumption
6   that it is a means to liquidate the estate.
7   Q. (By Mr. Bacon) Part of your assignment was
8   to determine the discount to the petition time price
9   following the hypothetical liquidation of the
10 debtor's assets, right?
11   A. Yes.
12   Q. So I want to give you a different
13 assignment now, okay, and I'm not going to
14 compensate you at your hourly rate for doing so.
15   A. I think we're on the clock.
16   Q. Someone else here at the table is.
17   I'm going to -- I want you to assume that
18 in valuating -- in valuing the customer's claims
19 that you look at how a hypothetical customer would
20 sell their own assets, okay.
21   A. I could have taken on such an assignment,
22 but that is, to be clear, outside the scope of the
23 work I did.
24   Q. Yeah. I'm asking you to assume that right
25 now.

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1   A. Okay.
2   Q. We're valuing customer claims, and we're
3 seeing how a customer would go about selling their
4 own position at the petition time.
5   Are those risks we just discussed the same
6 for that hypothetical customer?
7   A. The risks that we discussed in taking on a
8 position in perpetual futures markets?
9   Q. Yes. And maybe -- let me bring them to
10 you one at a time to make it easier, okay?
11   A. Are we -- in your hypothetical, the estate
12 is returning assets to customers in kind, and they
13 are liquidating their own holding?
14   Q. No. In my hypothetical, the task before
15 us is to determine the value of a customer claim.
16 And the way I'm going to determine the value of a
17 customer claim is to determine how hypothetically a
18 customer would sell their assets at petition time.
19   A. I don't think I can follow along with you
20 here because the customer isn't the one doing the
21 liquidating. The debtor is the one doing the
22 liquidating.
23   Q. So --
24   A. And the debtor is not allowed to return to
25 customers assets in kind, so it must be the debtor

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1 doing the liquidating.
2   Q. So we're going to get into a thought
3 experiment. So we're going to imagine that
4 customers have claims. The way to evaluate those
5 claims is to see how that customer would sell their
6 assets at petition time; a hypothetical customer.
7   MR. GLUECKSTEIN: Well, I object to this.
8 You keep saying that a customer sells their assets.
9 They don't have any assets, so what does this have
10 to do with her opinion in this case?
11   Q. (By Mr. Bacon) So I'm going to ask you to
12 assume that if you were to evaluate a customer
13 claim -- I'll give you more concrete example, okay.
14 I want to do it this way, right.
15   If a customer claims that it had 1,000 of
16 a hypothetical token, and let's say the estate has
17 10,000, all right? I want to evaluate the value of
18 that customer's claim based upon selling just the
19 bets.
20   A. That is certainly feasible. The reason
21 that I don't do that and I don't think it's relevant
22 to the question at hand is that we must deal with
23 what would happen to the remaining holdings. We
24 cannot assume that the customer claims amounts are
25 liquidated in isolation.

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1   Q. No. We could assume that. You're
2 choosing not to assume that.
3   A. I think we have to consider the debtor's
4 holdings because, for example, if we take, you know,
5 one customer's claim in isolation, then we don't
6 know what the externalities of other customers, for
7 example, liquidating their holdings would be.
8   I think you can see that very well in the
9 clients on whose behalf you all here have come today
10 in that one customer, you know, has -- might --
11 would be selling 10 percent of daily volume, say,
12 and another customer would be selling 10 percent of
13 daily volume as, for example, Mr. Konstantinidis
14 suggests. It is common sense that both of those
15 trades are going to have some impact on the price.
16   So, therefore, it would have negative
17 externalities on each other. And that's just two
18 customers, much less potentially many others who
19 would be liquidating at the same time.
20   So I disagree with the premise of a
21 thought experiment where one customer is selling,
22 you know, just their holdings as part of this
23 process, you know.
24   We can obviously do the thought experiment
25 that if only one customer sold one Serum as part of

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1 this whole liquidation process and resolution of the
2 bankruptcy, there might not be a large discount, but
3 I don't think that such a thought experiment is
4 relevant to the matter.
5   Q. So I'm imagining a world in which
6 customers have claims, that we engage in an
7 experiment where we see how much that claim would be
8 worth if the customer sold his claim. And then
9 let's just say those claims -- those claims amount
10 to -- each customer's claim is a certain percentage
11 of all the customers' claims. We go ahead
12 separately and liquidate the debtor's estate. I
13 have a percentage of the estate to which I'm
14 entitled to, okay. So that's the world that I'm
15 imagining right now.
16   So in that world, does accessing the
17 perpetual futures market run counter to the goal of
18 liquidating the estate?
19   A. I really can't speculate --
20   MR. GLUECKSTEIN: Object to the form.
21   A. -- on that. I don't know how -- what --
22 access to what trading technology customers would
23 have. I furthermore know that the -- there was no
24 perpetual futures volume following the petition
25 time, so this trading strategy would not have been

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1   available to customers. And it would have been
2   reasonable, as I say in my report, to expect that
3   perpetual futures volume to dry up, given Serum's
4   dependence on FTX.
5   So I don't think that would have been --
6   that, you know, is a plausible trading strategy, but
7   more importantly, the hypothetical you described
8   causes claims to amount to far more than a hundred
9   percent of what the debtor would ultimately get when
10   they liquidate their holdings in cash.
11   So, you know, the fraud and mismanagement
12   at FTX creates this problem of a difference in the
13   composition of assets where customer claims are
14   taken together on more liquid assets with deeper
15   markets like Bitcoin or Tether while the debtor's
16   holdings are more concentrated in less liquid
17   markets like MAPS, OXY, and Serum, and so there is a
18   shortfall in liquidating the debtor's assets of
19   those holdings relative to customer claims.
20   And for that reason, it's -- it would have
21   been, in my view, essentially infeasible given the
22   assignment to liquidate all of the holdings of
23   digital assets to take each customer claim and try
24   to value that in isolation without considering these
25   negative externalities or negative spillovers from

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1   liquidating the remaining holdings.
2   Q. Is your methodology designed such that the
3   customer claims reach 100 percent of the debtor's
4   estate?
5   A. That was not the way I formulated the
6   process.
7   Q. Because you just said to me that it was
8   going to be a problem if the customer -- if the
9   value of the customer claims was less than a hundred
10   percent of the liquidation value of the debtor's
11   estate.
12   MR. GLUECKSTEIN: Object. That misstates
13   the testimony.
14   A. I guess my view is that going in the --
15   ultimately going in the direction of customer claims
16   taken in isolation would not help resolve the
17   question of how to distribute proceeds from
18   liquidating the debtor's assets as is required as
19   part of bankruptcy process.
20   Q. (By Mr. Bacon) I want to talk about
21   futures for a little bit, and we're just going to
22   talk about futures trading strategies. I'm not
23   going to talk about the debtor or the customer, just
24   focusing on futures trading strategies, okay?
25   A. Okay.

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1   Q. So do you know how you would employ a
2   futures trading strategy to -- sorry. Let me start
3   over.
4   Do you know how you would access the
5   perpetual futures market as part of the strategy to
6   liquidate a spot holding?
7   A. I did not consider that as part of my
8   analysis.
9   Q. When you say it's not possible in your
10   report, though, is that limited to the debtor?
11   A. Yes. As far as I understand,
12   Mr. Gkatzimas' proposed strategy for using perpetual
13   futures market to liquidate holdings in Serum is not
14   feasible.
15   Q. I'm sorry. Did we ever give you your
16   report as an exhibit?
17   A. No. I don't have it.
18   (Exhibit 6 was marked for identification.)
19   Q. (By Mr. Bacon) We're handing you now
20   what's been marked as Exhibit 6 which is your
21   rebuttal report in response to Gkatzimas. It's
22   dated February 2nd, 2024.
23   A. Yes.
24   Q. Do you have that?
25   A. Yes.

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1   Q. I want to direct you to paragraph 21 of
2   that report, the first line of 21 which states:
3   Perpetual futures cannot be used for liquidating
4   digital assets.
5   Do you see that?
6   A. Yes.
7   Q. Is that something that's supposed to only
8   apply to the debtor being able to liquidate
9   perpetual futures -- or liquidate digital assets
10   using perpetual futures, or does that statement
11   apply to anyone?
12   A. As a general matter, in perpetual futures
13   trading, the underlying asset never changes hand so
14   no market participant can use perpetual futures to
15   sell holdings of the underlying.
16   Q. And can a market participant use perpetual
17   futures as part of a trading strategy to liquidate
18   digital assets?
19   A. A market participant could receive cash
20   flows associated from increases or decreases in the
21   price, depending on whether they take a long or
22   short position in futures markets, but that is
23   essentially a separate question from whether or not
24   they are selling the underlying in spot markets.
25   Q. Could they -- but could you access the

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1 perpetual futures market as part of a strategy
2 involving selling the underlying spot?
3   A. I mean, a hedge fund could certainly take
4 multiple positions in derivative and spot markets at
5 the same time as part of a strategy to maximize
6 value. I mean --
7   Q. Do you know how they would go about doing
8 that, what the strategy would look like?
9   A. Go about doing exactly what?
10   Q. Employing that strategy that you just
11 described.
12   A. No. That was outside the scope of my
13 analysis. I can only -- I can comment on what
14 Mr. Gkatzimas specifically proposed for the debtor,
15 but in general, I -- you know, I did not work on
16 hedging strategies and perpetual futures markets as
17 part of my analysis.
18   Q. If there was a market participant that
19 held a long spot position, they could hedge part of
20 that spot position by taking a short position in the
21 perpetual futures market, right?
22   A. They could hedge against downward pricing
23 events with a short position in perpetual futures
24 markets, yes.
25   Q. And putting on a hedge position in the

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1 perpetual futures market, all else equal would tend
2 to move down the price in the perpetual futures
3 market, right?
4   A. The perpetual futures contracts operated
5 slightly differently in all the different exchanges,
6 but they generally use a funding rate mechanism that
7 incentivizes participants to keep the futures prices
8 close to the underlying spot price.
9   Q. And that's a periodic funding mechanism;
10 it's not constant.
11   A. At FTX, it was every hour.
12   Q. Generally speaking, if you put on a short
13 position, that would tend -- all else equal, putting
14 on a short position would tend to move down the
15 price in the market as opposed to in the futures
16 market?
17   A. In general, yeah.
18   Q. When prices deviate between a spot and
19 futures market, do you know what that's called?
20   A. A price disparity between the spot and
21 futures?
22   Q. Yeah. A spread? Purely terminology.
23   A. Okay.
24   Q. Can we call that a spread?
25   A. Okay.

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1   Q. Are you familiar with a spread arbitrage
2 trade?
3   A. No.
4   Q. If a spot market exists in the absence of
5 a futures market, does that -- let me start over.
6 We'll get there.
7   If you have a spot market on -- if you
8 have a product that you want to spot and there's no
9 futures market, and you have a product that trades
10 spot and there's a future market, all else equal, do
11 you have an opinion on which has more robust
12 liquidity?
13   A. It depends on how well integrated the spot
14 in the futures markets are, so I can't speculate in
15 general. In perpetual futures in cryptocurrencies,
16 there were -- have been times when they are not well
17 integrated, and the prices deviated substantially
18 and other times when they are tightly integrated.
19 For hedging exposure of risk in conventional
20 markets, we generally think about a more liquid
21 market incorporating futures volume.
22   Q. If I trade a product in a spot market that
23 has a future -- let's say it's a robust future
24 market to take away any concerns about the futures
25 market not sufficiently correlating with the spot

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1 market.
2   So if I trade a product in a spot market
3 that has a robust futures market, do those markets
4 interact as one liquidity pool?
5   A. It depends on the goal of the market
6 participant. If the market participant is focused
7 on exposure to price changes, then they do operate
8 as one market whereas if the market participant is
9 interested in exiting a position, then it is the
10 spot market that is relevant to that exercise.
11   And a good example of where we can see
12 that differential is that in the Kyle and Obizhaeva
13 2016 paper, they focus on spot volumes because these
14 portfolio transition trades represent bets to sell
15 positions in the underlying whereas in their 2023
16 paper, some of the price crashes that they seek to
17 model involve traders who were focused on adjusting
18 exposure, like some of George Soros' big trades is I
19 think one example or curve yields in 2008. There,
20 they include both the spot and the futures markets
21 as one whole market because it is an adjustment of
22 price exposure that they are modeling.
23   Q. But your model just takes into account the
24 spot and not like the 2023 model that takes into
25 account the spot and the futures?

35 (Pages 134 to 137)

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 1       A.   Correct.  I use spot volumes.
 2       Q.   And the 2016 report -- the 2016 K&O
 3   article is based on stocks, right; the NASDAQ, and I
 4   think there was another exchange?
 5       A.   New York Stock Exchange.
 6       Q.   New York Stock Exchange.  Are you aware of
 7   what the volume is in single stock futures?
 8       A.   No.  I mean, this is like -- can I list
 9   off futures volumes for publicly-traded equities?
10   Is that what you're asking?
11       Q.   Do you have a sense of what the single
12   stock future volume in the United States was in
13   2023, an order of magnitude?
14       MR. GLUECKSTEIN:  Objection.  We are now
15   so far now afield from this report, it's becoming a
16   problem, so I suggest we focus on what she's
17   actually offering an opinion on.
18       A.   I agree with counsel's assessment.
19       Q.   (By Mr. Bacon) Do you have any sense of
20   the magnitude of the single stock futures volume in
21   2023?
22       A.   No.
23       Q.   Do you have an opinion whether -- back to
24   our example of you have a spot market in one hand,
25   and then you have another hypothetical situation in
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 1   which you've got a spot market and a robust futures
 2   market.
 3       In that situation with a spot market and a
 4   robust futures market, do you think that selling in
 5   the spot market has less price impact or more price
 6   impact than selling in a market where there was only
 7   a spot market?
 8       MR. GLUECKSTEIN:  Objection.  This is a
 9   hypothetical.  We're not talking about anything in
10   particular.  We're just asking her to testify about
11   futures markets with no tether to this case.  I'm
12   not going to let this go on much longer.
13       Q.   (By Mr. Bacon) Imagine that you had a
14   thousand Serum coins, okay, and there was only a
15   spot market.  You magically had a thousand Serum
16   coins, and there was a spot market and a perpetual
17   futures market.  If you sold those -- in both
18   instances, if you just sold in the spot market,
19   would you expect more or less price impact between
20   those two situations?
21       MR. GLUECKSTEIN:  Object to the form.
22       A.   My assignment was to consider an orderly
23   liquidation beginning at the petition time, and I
24   would expect that the collapse of FTX would have a
25   negative impact on perpetual futures markets for
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 1   Serum, and so I would not expect that volume to
 2   persist, and indeed, all of the perpetual futures
 3   volume evaporated shortly after the petition date.
 4       So to bring us back to the question at
 5   hand which is valuating claims to FTX holdings of
 6   Serum at the petition time, as I say in my report, I
 7   would reasonably expect investor interest in Serum
 8   and its perpetual futures to decline following the
 9   bankruptcy which it did.
10       Q.   (By Mr. Bacon) But your methodology does
11   not take into account post-petition liquidity, is
12   that right?
13       A.   That's correct.
14       Q.   So I'm going to try this one more time.
15       If I sold an asset in a spot market, all
16   else equal, if there was another situation where
17   there was a spot market and a robust futures market,
18   where would you expect there to be greater price
19   impact?
20       A.   I think in general, it would again depend
21   on how well integrated the spot and the futures
22   markets are, so I can't speak without having some
23   concrete example, and I don't think that perpetual
24   futures volume is relevant to liquidating the
25   debtor's holding of Serum starting on the petition
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 1   date.
 2       Q.   If you sell a product in a spot market --
 3   here.  Let me try it this way.
 4       If you sell a product solely in a spot
 5   market but there is a futures -- a robust futures
 6   market for the same, you know, underlying, does the
 7   futures liquidity come into play at all in assessing
 8   the price impact on the spot market?
 9       A.   I think it can.  As I mentioned, I agree,
10   for example, with Kyle and Obizhaeva's 2023 decision
11   to include both spot and futures market in their
12   analyses of some of the price crashes that they
13   study in that paper but not all.  I think it is a
14   case-by-case question given the traders' motivations
15   in placing the bet.
16       Q.   But in your original report, you did not
17   make that assessment one way or the other, correct?
18       A.   I made the assessment to include only spot
19   volumes.
20       Q.   Did you make a determination not to
21   include futures?
22       A.   Yes.  I think that's --
23       Q.   Was that -- like, did you have a futures
24   date in front of you, you analyzed product by
25   product, and you said I'm not going to do the
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1    futures?
2        A.  When I said case by case, not necessarily
3    asset by asset but rather, strategy by strategy.  So
4    the decision to take a long-term position of selling
5    holdings of the underlying with the explicit
6    instructions from the court to exit holdings of
7    digital assets, with that trading idea in mind, I
8    felt that only spot markets were relevant, and that
9    applied across all of the digital assets under my
10   consideration.
11       Q.  Do you agree that if a spot and robust
12   futures market exist that if I shorted a position in
13   the spot market that there would be downward price
14   pressure in the spot market which a trader could
15   arbitrage against the futures market?
16       MR. GLUECKSTEIN:  Object to the form.
17   Again, this has no relevance to what we're doing
18   here.  You cannot continue to ask her to testify
19   about futures.  That has nothing -- you're not tying
20   to the case or anything.  You're just asking her
21   opinion.  You're just asking her to talk about
22   futures trading and strategies.  This has nothing to
23   do with anything.
24       MR. BACON:  If you're saying that her
25   opinion has nothing to do with futures trading and
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1    strategy, I will take that representation.
2        MR. GLUECKSTEIN:  She explained what she
3    explained as to why futures is not -- was not
4    considered in her report and why she doesn't believe
5    it to be viable.  You're asking her about
6    hypothetical trading strategies.  She's not here to
7    testify as a trader.
8        Q.  (By Mr. Bacon) Are you here to -- can you
9    testify about futures trading strategies?
10       A.  Futures trading strategies as a general
11   matter are beyond the scope of my analysis for this
12   matter.
13       MR. BACON:  Give me -- let me take a
14   break.  I think we're done.  Just give me five
15   minutes, and then we'll be back.
16       (A break was taken.)
17            EXAMINATION
18   BY MR. GWYNNE:
19       Q.  Good afternoon, Professor Howell.  My
20   name's Kurt Gwynne, and my firm, Reed Smith,
21   represents Fondation Elements, Fondation
22   Serendipity, Serendipity Network, Limited, and
23   Liquidity Network, Limited.
24       When you referred to the debtor's holding
25   of tokens, are you distinguishing between what FTX
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1    and Alameda on the one hand hold and what creditors
2    on the other hand hold?
3        A.  When I consider debtor's holdings, those
4    are the assets that I was told the estate has
5    recovered from FTX and Alameda.  However, I'm not a
6    lawyer, and I'm not sure exactly what the various
7    subsidiaries of those two entities were holding and
8    how the assets were distributed across them.
9        I was simply given a number for each
10   digital asset representing the quantity of that
11   token in the overall debtor's holdings that is
12   available to be potentially liquidated in order to
13   to make distributions to creditors.
14       Q.  Do you distinguish between tokens held by
15   creditors and tokens held by FTX Trading and its
16   affiliates?
17       A.  I'm not exactly following what you mean by
18   distinguish.  I have information about customer
19   scheduled claims.  They're not holding the tokens;
20   they have claims to tokens.  The debtor is holding
21   tokens that it is instructed to liquidate.
22       Q.  What's the amount of tokens for which
23   creditors have claims against the debtors, and
24   please feel free to refer to your report.
25       MR. GLUECKSTEIN:  Are you talking about
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1    the entire estate?
2        MR. GWYNNE:  For MAPS and OXY, yes.
3        MR. GLUECKSTEIN:  For MAPS and OXY.
4        MR. GWYNNE:  Yeah.
5        A.  The at-issue tokens collectively comprise
6    53 percent of the face value of the debtor's
7    holdings which is $9.5 billion, so roughly 4.8
8    billion, but I am not sure I have the exact number
9    in my report.
10       Q.  (By Mr. Gwynne) How many MAPS tokens
11   unlocked do the debtors hold?
12       A.  I don't recall exactly.  I -- I have the
13   number 10 billion in my head, but I could be wrong.
14       Q.  Is it in --
15       A.  I know that the debtor's -- the MAPS --
16   the face value of the MAPS holdings was about a
17   billion dollars at petition time price.
18       Q.  So in your report, you don't list the
19   amount of MAPS tokens that the debtor and its
20   affiliates hold, is that right?
21       A.  I don't -- no.  I don't think so.
22       Q.  So do you list the face value of the
23   unlocked MAPS tokens that the debtors hold?
24       MR. GLUECKSTEIN:  Object to the form.
25       A.  We -- no, we do not report that.  We
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1 report in Figure 11 of my initial report the face
2 value of the debtor holdings for MAPS as one of the
3 top five, but we did not think it was relevant to
4 report the face value or number of tokens for every
5 single asset. That would -- essentially it would be
6 outside the scope of -- of my analysis.
7   Sorry. You know what? We do have the
8 face value in Figure 13. We have the top five
9 digital assets by asset liquidation discount which
10 includes both Serum at 3.7 billion, MAPS at 992
11 billion, and OXY at 314 billion. So you could just
12 divide that by the petition time price to obtain the
13 holdings and the quantity.
14   Q. All right. So in Figure 13 where you have
15 the face value the customer claims at 397.13
16 million, that claim is not in addition to the 992.96
17 million listed as the face value of the debtor's
18 holdings, correct?
19   A. That's right. They are different
20 conceptually.
21   Q. What I'm trying to ask is the face value
22 of the debtor's holdings, the 992.96 million, does
23 that also include tokens for which creditors have
24 claims against the debtor?
25   A. So this difference exactly speaks to the

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1 imbalance in the composition of assets between
2 customer claims and debtor holdings. For some
3 assets, customer claims are to a smaller number of
4 tokens than the debtor was holding like MAPS, and in
5 other cases, to more tokens than the debtor was
6 holding like Bitcoin or Tether.
7   And so in this case, the face value of the
8 customer claims is smaller than the face value for
9 their holdings because the debtor, Sam Bankman-Fried
10 and his fellow managers at FTX chose to acquire, I
11 guess, more -- more MAPS relative to customer
12 accounts.
13   Q. I understand that the customer claim is
14 smaller than the face value of the debtor's
15 holdings. I can see that. What I'm asking you
16 is -- and I guess I'm not doing it artfully. I
17 apologize. Is this face value of the customer
18 claims, is that just a subset of the face value of
19 the debtor's holdings?
20   A. I don't know what you mean by subset. I
21 said it is smaller than, but they are not -- I don't
22 think of it as the same pool.
23   Q. Well, let me ask this.
24   A. We have -- the debtor's holdings have to
25 be liquidated to satisfy customer claims.

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1   Q. What's the total amount of face value of
2 MAPS tokens held by the debtor?
3   A. At petition time price, it's this 992
4 million.
5   Q. And of that amount, creditors have claims
6 for 397.13 million, is that correct?
7   A. Yes.
8   Q. So the debtor is not selling 992.96
9 million plus 397.13 million?
10   A. That's right. The debtor only has the
11 quantity of tokens associated with that 992 million
12 to sell.
13   Q. Thank you.
14   A. For MAPS, the price sits lower than the
15 petition time price, so if we were to do this
16 exercise today with current prices, it would be less
17 than 992 million.
18   Q. Well, I'm just trying to understand your
19 report since you don't list it or it's not, I guess,
20 apparent.
21   With respect to the debtor's holdings of
22 OXY tokens, the total amount the debtor holds is
23 314.08 million, according to Figure 13, right?
24   A. Yes.
25   Q. And against that amount, creditors have

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1 claims for 208.88 million, correct?
2   A. Yes.
3   Q. Now, is it your understanding that FTX
4 Trading, Limited and Alameda had the right under the
5 terms of service to sell positions attributable to
6 customers as of the petition date?
7   MR. GLUECKSTEIN: Object that it calls for
8 a legal conclusion.
9   A. I'm not a lawyer, so it's beyond the scope
10 of my expertise to opine on those contracts or terms
11 of those contracts.
12   Q. (By Mr. Gwynne) I'm asking you, I guess,
13 you're understanding, not whether you're a lawyer.
14   In your analysis, did you understand or
15 assume that FTX Trading, Limited and Alameda had the
16 right under its agreements to sell positions
17 attributable to customers as of the petition date?
18   A. To clarify, do you mean as part of the
19 resolution of the bankruptcy process, did they have
20 the right to sell their holdings of individual
21 assets?
22   Q. As part of your analysis, did you assume
23 they had that right as of the petition date
24 regardless of any contractual terms to the contract?
25   A. Yes. I assumed that the debtor would be

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1   selling its holdings in a liquidation commencing on
2   the petition date.
3   Q. And so you treated all of the debtor's
4   holdings of MAPS and OXY tokens as if they were
5   unlocked on the petition date --
6   A. Yes.
7   Q. -- and could be sold, right?
8   A. Yes.
9   Q. And what was the basis for that
10 assumption?
11   A. I have been informed by counsel on behalf
12 of FTX that all of the tokens are unlocked.
13   Q. Earlier today, you testified about 3
14 percent and 11 percent of holdings and that if
15 creditors had above or below that amount, they may
16 not have a discount of a hundred percent of the
17 value of the token. I didn't totally follow that,
18 so I'd like to ask you about that again.
19   Is there some percentage of MAPS tokens
20 that if creditors held, they would not have a
21 hundred percent discount under your analysis?
22   A. I apply the discount to liquidating the
23 debtor's holdings to all customer claims to that
24 asset regardless of the quantity of the creditor
25 claims to that asset as part of my method.

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1   Q. Is there an amount or percentage of
2   customer claims for MAPS that would be large enough
3   to not have a hundred percent discount?
4   A. The larger the amount, the higher the
5   discount in liquidation as a general matter, but I
6   think you mean -- perhaps you mean small.
7   Q. Well, I don't necessarily mean anything.
8   I'm guess I'm trying to ask what you mean. Go
9   ahead.
10   A. What I think I said before is that I did
11 one set of analyses to show that the debtor's
12 holdings of these tokens would have to be on the
13 order of 3 to 11 percent of total token supply in
14 order to get asset liquidation discounts under a
15 hundred percent.
16   Q. And what is the debtor's percentage
17 holding of these tokens, MAPS and OXY?
18   A. For MAPS, the debtor holds 99.8 percent of
19 all token supply, as I recall. For OXY, I believe
20 it's 97.8 percent of all token supply.
21   Q. And your testimony is the debtor would
22 have to hold less than 3 percent in order for there
23 not to be a hundred percent asset liquidation
24 discount in your analysis, is that right?
25   A. I recall this as a supplemental analysis

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1   that I did, but it is not in the report, and I feel
2   if this is a question of great importance that it
3   would make sense to -- I would like -- I would
4   prefer to return to my analytical work on that and
5   confirm exactly what I -- what I found.
6   That is what -- that is what I recall, but
7   it is -- it is somewhat speculative because it's not
8   in my report, and it's -- I don't want to misstate
9   exactly what I did.
10   The point is that the holdings are -- what
11 I was trying to get across when I initially threw
12 out those -- those numbers is that the -- the
13 holdings in practice are so large that they -- you
14 know, even selling much smaller amounts relative to
15 the holdings continue to produce a hundred percent
16 liquidation discounts.
17   In one place we can see that in my reports
18 is in -- is in Figure 13 on page 49. We see using
19 Mr. Konstantinidis' methodology with corrected
20 trading volume inputs that on a customer-by-customer
21 basis, the discounts for MAPS and OXY remain at a
22 hundred percent for the customers on whose behalf
23 Konstantinidis filed the report with time for
24 liquidation of 318 years in the case of MAPS and 97
25 years in the case of OXY.

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1   Q. For the record, you're looking at Figure
2   13 of your rebuttal report, is that correct?
3   A. Yes.
4   Q. If you could close the reports and the
5   documents in front of you, please.
6   In your view, is the market for MAPS a
7   mature market?
8   A. In the context of cryptocurrency markets
9   generally, or do you mean in a broader sense?
10   Q. Both.
11   A. I would say in the context of the
12 cryptocurrency markets, it was relatively mature,
13 having been around for a couple of years since many
14 of these projects are very young. In the context of
15 entrepreneurial finance more broadly, a project only
16 a couple of years old would be usually considered
17 immature.
18   Q. Is the market for OXY mature?
19   A. Since OXY is about the same age as MAPS,
20 I'll have the same answer.
21   Q. Is the market for MAPS similarly mature to
22 markets for equities, bonds, commodities, and
23 currencies?
24   MR. GLUECKSTEIN: Object to the form.
25   A. I think the market structure for trading

39 (Pages 150 to 153)

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1 these tokens, as it existed on the petition date,
2 has much in common from a market macrostructure
3 perspective as markets for trading stocks and bonds.
4   Q.   (By Mr. Gwynne) What does the phrase
5 mature market mean to you?
6   A.   To be honest, I'm not exactly sure what
7 you're getting at with the word mature. There
8 are -- you know, these tokens were traded on
9 multiple venues and had years of price and volume
10 history and had derivatives associated with them.
11   There were financial intermediaries
12 engaged in the markets, so from that perspective, we
13 might say that they were reasonably mature. But I
14 don't believe mature -- as far as I know, I don't
15 have a technical definition associated with it.
16 There may be one, but I don't know it.
17   Q.   In what ways, if any, is the market for
18 MAPS similar to the markets for equities, bonds,
19 commodities, or currencies?
20   A.   Well, you have traders, including a
21 relatively large faction of sophisticated
22 institutions such as hedge funds trading but also
23 many retail investors who are less sophisticated
24 trading, and all of these participants are making
25 arm's length online trades on exchanges that were in

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1 some ways modeled after the way stock exchanges
2 operate, and therefore, they have similar market
3 structure characteristics.
4   Q.   Would your answer be the same for the
5 market for OXY tokens?
6   A.   Yes.
7   Q.   Are there any other similarities between
8 the markets for MAPS and OXY tokens and the markets
9 for equities, bonds, commodities, or currencies?
10   A.   They both have prices that are updated on
11 a very regular basis. They have information about
12 volume and -- historical price and volume data that
13 is available to all participants. So in some sense,
14 they are financial markets for assets that are very
15 similar to financial markets for conventional
16 equities except that the underlying are
17 blockchain-based currencies and tokens as opposed to
18 conventional companies.
19   Q.   What, if anything, are the differences in
20 the market for MAPS tokens and the markets for
21 equities, bonds, commodities, or currencies?
22   A.   The markets for MAPS and OXY tokens are
23 much less well regulated and feature large amounts
24 of fraudulent volume designed to make the exchanges
25 appear to be more liquid than they really are. This

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1 is not a problem that we believe that is prevalent
2 in conventional stock markets. That would be one
3 important difference.
4   Q.   Are there any other differences?
5   A.   These markets are operating 24/7 whereas
6 stock markets operate on business hours. That would
7 be another difference.
8   Q.   Is the market for MAPS tokens more or less
9 volatile than the markets for equities, bonds,
10 commodities, or currencies?
11   MR. GLUECKSTEIN: Object to the form.
12   A.   It would depend on the specific
13 conventional market that you are considering. On
14 average -- you know, relative to sort of the average
15 asset in conventional financial markets, these
16 tokens are volatile or have volatile prices.
17   Q.   (By Mr. Gwynne) How would you compare the
18 volatility of MAPS tokens to securities traded on
19 the New York Stock Exchange?
20   A.   On average, MAPS volatility is higher than
21 stocks traded on the New York Stock Exchange.
22   Q.   Much higher?
23   A.   It would depend on the stock and the
24 particular period we were looking at.
25   Q.   How about the year prior to November 11th,

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1 2022?
2   A.   The average volatility for MAPS is in the
3 appendix of my rebuttal report. I don't have on
4 hand volatility numbers for the New York Stock
5 Exchange during that same period.
6   Q.   And you don't have a general idea whether
7 the MAPS tokens were more volatile than the New York
8 Stock Exchange?
9   A.   As I said earlier, I believe they are more
10 volatile.
11   Q.   What about the volatility of the MAPS
12 tokens during that same time period as compared to
13 securities traded on the NASDAQ?
14   A.   I believe it is more volatile on average.
15   Q.   Would your answers be the same for OXY
16 with respect to its volatility compared to the New
17 York Stock Exchange and NASDAQ-traded securities?
18   A.   Yes. I thought that's what I just
19 answered, but yes. I think both MAPS and OXY have
20 relatively volatile prices compared to the average
21 stock on the New York Stock Exchange or NASDAQ.
22   Q.   Do you believe there are competitive
23 market makers with respect to MAPS tokens?
24   A.   There certainly are market makers in
25 digital asset markets. I don't have an opinion on

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1 how competitive they are.
2   Q. But are there competitive market makers
3 with respect to MAPS tokens in particular?
4   A. I can't speculate on that topic.
5   Q. Are there competitive market makers with
6 respect to OXY tokens?
7   A. I also can't speculate on that.
8   Q. To estimate trading volume in your
9 analysis, did you try to remove the effect of FTX
10 bankruptcy on trading levels?
11   A. I chose to use a one-year period for
12 measuring volume ending before the CoinDesk article
13 appeared on November 2nd, 2022 because I felt that
14 the high level of uncertainty in digital asset
15 markets between that day and the petition date would
16 be unlikely to persist over the course of a long
17 liquidation process.
18   Q. I understand that's what you did, but I
19 don't think you answered my question. You're more
20 than welcome to explain your answer, but if you
21 could answer yes or no and then explain.
22   When estimating volume, did you seek to
23 remove the effect of FTX bankruptcy on trade levels?
24   MR. GLUECKSTEIN: Object to the form.
25   A. No. That wasn't my explicit intent. It

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1 was more to assess trading volume on a typical day
2 as it would be most likely to proceed after the
3 petition time.
4   Q. (By Mr. Gwynne) Well, then why did you
5 remove the time period closest to the petition if
6 you weren't trying to remove the effect of the
7 bankruptcy from your determination of trade volume?
8   A. Well, the reason I was answering, you
9 know, with a caveat is because it's not exactly the
10 effect of the bankruptcy, but rather, a desire to
11 ensure that I was not assuming that every day would
12 be such a major news day as occurred on the petition
13 date and the week leading up to it. And so that,
14 you know, was news around the collapse of FTX. I'm
15 not exactly sure whether it would be legally correct
16 to call that the bankruptcy's effect, but I would
17 note that upon reading Mr. Konstantinidis' report, I
18 reestimated the discounts using the one year ending
19 on November 2nd, so including this period that we're
20 discussing. And the discounts remain a hundred
21 percent for MAPS and OXY and increase to 63 percent
22 for Serum, so my estimates are not especially
23 sensitive to the particular period that we choose
24 here.
25   Q. When estimating price, though, you took

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1 the petition time price from Mr. Lu, right?
2   A. Yes.
3   Q. Why didn't you ignore the time period
4 after the CoinDesk article when determining the
5 appropriate price?
6   A. Because prices are not the same thing as
7 volume and volatility. Specifically, the best
8 prediction for future prices is the most recent
9 price. And so not only was it my assignment to
10 consider petition time prices, but also the most
11 reasonable input into my asset liquidation discount
12 model would be the most recent price.
13   Q. So if there was a spike or a big decline
14 in the price in the 60 minutes before the petition
15 date, you would still consider that to be the best
16 indicator of price after the petition date. Is that
17 your testimony?
18   A. So first, I rely on --
19   Q. If you can say yes or no, and you can
20 explain.
21   MR. GLUECKSTEIN: She does not have to
22 answer yes or no to your questions.
23   MR. GWYNNE: She has to answer my
24 questions.
25   MR. GLUECKSTEIN: She has answered your

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1 questions.
2   A. The reason I would not answer it simply
3 yes or no is because you used the word spike. And
4 my -- I would defer to Mr. Lu, but my impression of
5 his methodology is it was very vigorous in
6 identifying accurate prices as of the petition time
7 using trustworthy exchanges with a large amount of
8 organic volume and a 60-minute interval.
9   And so it is my understanding that a
10 spurious, say, single transaction that created a
11 spike in the price would not bias his estimate, so
12 I -- I would leave that to his -- you know, for him
13 to discuss.
14   Q. So what happened to the pricing of MAPS
15 tokens between November 2nd and November 11th of
16 2022?
17   A. They declined as we were looking at in
18 Figure 4 of my rebuttal report.
19   Q. What happened to the pricing of OXY tokens
20 from November 2nd to November 11th, 2022?
21   A. They also declined in price.
22   Q. Now, you say that the assignment you were
23 given by Sullivan & Cromwell was to assume that the
24 debtor had to sell all of his MAPS and OXY tokens,
25 correct?

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1   A. Yes.
2   Q. And do you believe that as of the petition
3 date, the only possible outcome in the debtor's
4 bankruptcy cases was to liquidate all of their
5 digital assets?
6   A. I'm not a bankruptcy lawyer, so I can't
7 speak to what other approaches there might be for
8 making distributions to creditors.
9   Q. Were you aware that whether on or after
10 the petition date any parties advocated restarting
11 the FTX exchange?
12   A. I know that there were discussions about
13 restarting the FTX exchange.
14   Q. And what do you know about those
15 discussions?
16   A. Only -- they were only relevant to my
17 analysis because the FTT token could have
18 potentially had future utility value if it had a
19 role in a restarted FTX exchange. And I was
20 informed that Mr. John Ray and his team at FTX had
21 determined that FTT would play no role in a
22 potential restart of the FTX exchange, and that
23 informed my initial report.
24   Q. And when were you told that determination
25 was made?

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1   A. I don't recall the exact date, but it was
2 between -- it was maybe October 2023 or November;
3 sometime in the mid fall.
4   Q. Were you told something different prior to
5 that date regarding the possibility of FTX
6 restarting as an exchange?
7   A. I didn't have any information from the
8 debtor counsel prior to that date. I had read the
9 news about FTX in general which would sometimes
10 mention the potential for a restart.
11   Q. If FTX had proposed a plan pursuant to
12 which the debtors decided to retain their MAPS and
13 OXY tokens as opposed to selling them, would that
14 change any of your opinions?
15   A. That would be a different assignment.
16   Q. So it would change your opinions?
17   A. Well, if I had not been assigned to assess
18 the discount from selling the debtor's holdings,
19 then yeah, I'm sure I would have a different
20 opinion. I mean, I would have a different -- I
21 would be studying a different question. I have my
22 opinion based on the question I was asked to study.
23   Q. Have you ever heard the phrase burning
24 tokens?
25   A. I have.

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1   Q. What does that mean?
2   A. It is where tokens are destroyed, for
3 example, by deleting the secret keys associated with
4 accounts holding them.
5   Q. And why are tokens burned, in your
6 experience?
7   A. They can be burned for multiple reasons.
8 In the case of the Serum and FTX exchanges, tokens
9 were burned as a way to increase the remaining
10 tokens' value.
11   Q. Did you consider whether the debtor would
12 be acting rationally in burning some of its tokens
13 so that the remaining tokens it possessed would have
14 value and could be sold positively?
15   A. I did not consider that as a possible
16 strategy since my understanding was the debtor had
17 been told to sell its holdings of digital assets,
18 not destroy them.
19   Q. Did the debtor tell you who told the
20 debtor that it had to sell the assets and that none
21 of them could be destroyed?
22   MR. GLUECKSTEIN: Objection; misstates
23 testimony.
24   A. My understanding --
25   Q. (By Mr. Gwynne) Excuse me. Hold on for a

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1 second. The question I just asked, did that
2 misstate any of your testimony? I didn't mean to
3 misstate it, but if I did, tell me how.
4   A. My understanding is that as part of the
5 bankruptcy process, the court has instructed the
6 debtor to liquidate its holdings of digital assets,
7 but again, I am not closely involved in the legal
8 processes.
9   Q. Understood.
10   A. I only -- I only know what kind of my
11 assignment was which was to consider liquidating all
12 of the holdings.
13   Q. I'm not asking you, of course, to make
14 legal conclusions or anything else. I'm just trying
15 to understand what you understood as part of your
16 charge.
17   And you understood that the court had
18 advised the debtor that it had to sell all of its
19 tokens, and they couldn't destroy or burn any, is
20 that right?
21   A. I don't want to speak to what the debtor
22 is exactly allowed or not allowed to do. I
23 understand that this case is sort of unique in
24 bankruptcy court, and there are -- you know, the
25 debtor could ask to do things or, you know, has --

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1   that were -- would maximize its ability to satisfy
2   creditors claims, so I don't want to opine on what
3   they exactly are allowed or not allowed to do.
4   Q.   Yeah. And I would ask you to listen
5   carefully to what my questions are because I'm not
6   asking you to opine on what the debtor can do. I'm
7   not asking you for legal conclusions. I'm asking
8   you what you understood, if anything, in your
9   assignment.
10   As a fact, did you understand that the
11 court had told the debtor that it had to sell all of
12 its tokens and that none of them could be
13 liquidated?
14   A.   Let me be precise. My assignment from
15 counsel acting on behalf of FTX was to consider
16 liquidating all of the debtor's holdings, and I will
17 -- whether -- who was exactly requiring them to do
18 that, I would leave to the lawyers to answer. I
19 don't know.
20   Q.   But you understood there was some
21 requirement that the debtor had to sell all of its
22 tokens, is that right?
23   A.   That was what I was hired to assess.
24   Q.   Is it your understanding that Sam
25 Bankman-Fried or anyone else at FTX owned the

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1   Maps.me application?
2   A.   Mr. Sam Bankman-Fried and his head of
3   product, another executive at FTX, were formal
4   advisors to Maps.me, and Alameda had invested $40
5   million in Maps.me.
6   In the course of entrepreneurial finance,
7   generally I would expect those relationships to be
8   associated with ownership stakes, but I am not privy
9   to whether he had any personal ownership stakes or
10 not in this particular case.
11   Q.   So all of that in what you're saying is
12 you don't know whether he -- whether Sam
13 Bankman-Fried or anyone else associated with FTX
14 owned the Maps.me application, right?
15   A.   Given what I know, I would -- I would
16 speculate that it would be very likely that they had
17 a stake in Maps.me because usually when you invest
18 tens of millions of dollars in a start-up, you
19 obtain an ownership stake, but I do not know what
20 that stake was in this particular case.
21   Q.   You said you don't know what that stake
22 was. Do you know if there was, in fact, any
23 ownership stake?
24   A.   No.
25   Q.   Is it your understanding that Sam

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1   Bankman-Fried or others associated with FTX
2   controlled the governance of the Maps.me
3   organization?
4   A.   Other than his role as a formal advisor,
5   no.
6   Q.   Is it your understanding that Sam
7   Bankman-Fried or others associated with FTX owned
8   the Oxygen.org application?
9   A.   Again, I would -- I have a strong belief
10 that there was an ownership stake based on the $50
11 million investment that Alameda made in Oxygen, but
12 I have not been informed as to that percent stake,
13 and I certainly can't rule out that they gave them
14 $50 million for nothing.
15   Q.   So you don't know whether there's an
16 ownership stake there or not, is that correct?
17   A.   Correct.
18   Q.   And is it your understanding that Sam
19 Bankman-Fried or others associated with FTX
20 controlled the governance of the oxygen.org entity?
21   A.   Insofar as they may have controlled a
22 large number of tokens for both OXY and MAPS which
23 had governance rights over those platforms, then I
24 suppose they would have some governance rights, but
25 I don't know whether they exercised those.

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1   Q.   Is it your understanding that Sam
2   Bankman-Fried and others from FTX were advisors to
3   the Solana blockchain?
4   A.   I have not heard of Mr. Sam Bankman-Fried
5   having as formal a role in the Solana ecosystem as
6   he did in OXY and MAPS, but I know he was a
7   proponent of the Solana blockchain.
8   Q.   So is your answer that you don't know if
9   he was an advisor to the Solana blockchain?
10   A.   That's correct. I don't know. I'm not
11 sure.
12   Q.   Are you aware whether Solana has increased
13 in value since the petition date?
14   A.   I believe it has.
15   Q.   Do you know by how much?
16   A.   I do not.
17   Q.   If one of the at-issue tokens, OXY or MAPS
18 tokens had a fundamental value, would your
19 calculation of the asset liquidation discount
20 extinguish that value?
21   A.   My asset liquidation discount estimates do
22 not depend on fundamental value.
23   Q.   So does that mean they would not
24 extinguish it, that your discount is independent
25 from the fundamental value that MAPS or OXY tokens

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1 may have?
2   A. My discount is an estimate of the likely
3 price at which the debtor could sell its holdings.
4 It is not a measure of fundamental value, and it
5 doesn't -- therefore, the discount estimate itself
6 cannot destroy fundamental value in any way.
7   Q. I believe you testified earlier that you
8 did not use CoinMarketCap trading volume for
9 purposes of determining your asset liquidation
10 discounts for MAPS and OXY tokens, correct?
11   A. Yes.
12   Q. And was the reason that you didn't use the
13 CoinMarketCap data the Bitwise, B-I-T-W-I-S-E,
14 article regarding the amount of fake volume on
15 CoinMarketCap?
16   A. I chose not to include additional
17 exchanges on CoinMarketCap that do not appear in
18 Coin Metrics because of evidence from a wide array
19 of sources that the overwhelming majority of volume
20 on those additional exchanges is not organic and
21 instead reflects wash trading.
22   Q. Do you agree that CoinMarketCap is a
23 reliable valuation tool for determining the US
24 dollar value of cryptocurrency tokens?
25   A. I believe that the most reliable price

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1 estimates that I had access to in this matter were
2 those developed by Kevin Lu at Coin Metrics using a
3 narrow set of highly trustworthy exchanges.
4   Q. That wasn't my question. My question was:
5 Do you agree that CoinMarketCap is a reliable
6 valuation tool for determining the US dollar value
7 of cryptocurrency tokens?
8   A. Reliable for what? The reason I didn't
9 answer yes or no is because I feel like it's --
10 reliable for what purpose? For example, for the
11 purposes of my ICO paper when I was doing the
12 research in 2017 in which to cast a very broad net
13 and include all frauds and scams, it was the best
14 available option and was more reliable than
15 competing data aggregators at that time. So if
16 you're asking me about is it reliable for the
17 purpose of that research, the answer would be yes.
18   If you're asking -- I assume since we're
19 talking about MAPS and OXY at the petition date, if
20 you're talking about is it reliable for those two
21 tokens, the answer is no. I do not think it is as
22 reliable as Kevin Lu's estimate of prices at the
23 petition date.
24   Q. Well, you're reframing my question, so I'm
25 going to ask it again because I give you the

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1 purpose --
2   A. What's the purpose?
3   Q. -- and I'm asking you about whether it's
4 reliable for this particular purpose.
5   Do you agree that CoinMarketCap is a
6 reliable valuation tool for determining the US
7 dollar value of cryptocurrency tokens?
8   A. You haven't given me a purpose; like, am I
9 writing an academic paper? Am I valuing -- am I
10 trying to identify a petition time price? So I
11 don't have -- without a purpose in mind, it's hard
12 for me to say no, I don't think it is perfectly
13 reliable.
14   Q. That's not my question. I said a reliable
15 valuation tool, and for the purpose, I said for
16 determining the US dollar value of cryptocurrency
17 tokens.
18   A. I really don't think that's fundamentally
19 a yes-or-no question because you're saying for the
20 purpose, but then you're saying dollar value of
21 cryptocurrency tokens, and that suggests that
22 there's a valuation process that CoinMarketCap is
23 undergoing.
24   I don't think that's -- you know, they are
25 aggregating prices from a wide array of exchanges,

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1 some of which are dominated by fraudulent trading,
2 and some of which are not. So they do have a price
3 for a lot of assets. I don't think the price is as
4 accurate as the Coin Metrics trusted exchange price,
5 and I can only imagine that that's what you're kind
6 of getting at, given the topic at hand.
7   Q. Don't worry about what I'm getting at.
8 I'm just asking you questions, trying to understand
9 -- I'm asking -- I'm trying to understand what you
10 understand, what you're thinking. I'm not getting
11 at things, okay, so you don't have to rephrase my
12 question. I'm just asking you, and I think you
13 answered that, so I'll move on. You say it's not a
14 yes-or-no question.
15   A. Yes.
16   Q. Do you agree that CoinMarketCap is the
17 most comprehensive and credible source of trading
18 data for digital assets?
19   A. It may include the most exchanges in its
20 coverages, so in that sense, we could call it the
21 most comprehensive.
22   Q. But my question was and credible source of
23 trading data for digital assets. Is CoinMarketCap
24 the most comprehensive and credible source of
25 trading data for digital access?

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1   A. No.
2   Q. Now, are you aware of what efforts
3 CoinMarketCap has taken to eliminate wash trading or
4 other fake volume from its data after the 2019
5 Bitwise article?
6   A. I am not aware of such actions. I do know
7 that they provide trust scores for the exchanges
8 that they cover, and I specifically considered the
9 trust scores of the additional exchanges on
10 CoinMarketCap not covered by Coin Metrics and found
11 that they had low trust scores, according to the
12 CoinMarketCap classification scheme.
13   And furthermore, when I estimate the asset
14 liquidation discounts using these alternative data
15 aggregation sources that Mr. Konstantinidis
16 suggested, I find discounts that remain at a hundred
17 percent for both MAPS and OXY across all three
18 sources that he suggested, including CoinMarketCap.
19 So it really doesn't affect the estimate for the
20 at-issue tokens whether we were to use CoinMarketCap
21 or not.
22   Q. Well, it affects -- it may have an effect
23 if you then determine the growth rate on top of that
24 amount, which you do not, right?
25   A. That is true.

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1   Q. So are you aware that CoinMarketCap
2 threatened to move -- remove exchanges from its
3 aggregation if they didn't provide mandatory
4 training data?
5   A. I am not aware of those policies.
6   Q. Are you aware that -- so you're not aware
7 of whether that additional mandatory data reporting
8 improved the accuracy of CoinMarketCap's reported
9 trading volume?
10   A. I am not. I believe their trust scores as
11 of recent weeks when I was looking at them are up to
12 date, given their current policies. These
13 incremental exchanges had trust scores that were
14 either in their sort of very poor quality range or,
15 you know, medium quality range.
16   Q. We'll get there, but I'm not asking you
17 about that yet.
18   Are you aware that CoinMarketCap announced
19 a data accountability and transparency alliance
20 after the 2019 Bitwise article?
21   A. No.
22   Q. So you're not aware of whether any such
23 alliance actually improved the accuracy of
24 CoinMarketCap's reported trading volume, right?
25   A. I am not.

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1   Q. Were you aware that after the 2019 Bitwise
2 article that CoinMarketCap started to exclude from
3 its trade volume any data from an exchange that does
4 not impose a trading fee?
5   A. I am not.
6   Q. So you're not aware of whether excluding
7 trading data from an exchange that doesn't impose a
8 fee has improved the reliability of CoinMarketCap's
9 trading volume data, right?
10   A. I am not.
11   Q. Are you aware that after the 2019 Bitwise
12 article that CoinMarketCap started reporting the
13 liquidity of all market pairs using a liquidity
14 score?
15   A. That seems likely to be related to the
16 trust scores that I looked at on an exchange level,
17 but I didn't look at -- at pairs, specific pairs
18 scores, if they exist.
19   Q. So you're not familiar with the liquidity
20 score for market pairs?
21   A. I'm not.
22   Q. So you're not aware of whether using that
23 liquidity score for market pairs has improved the
24 reliability of CoinMarketCap's trading volume data,
25 right?

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1   A. I am not.
2   Q. Are you aware that after that 2019 Bitwise
3 article that CoinMarketCap started using web traffic
4 as a measure to identify wash or fake trades?
5   A. I am not.
6   Q. So then --
7   A. I would just point out that the Cong, et
8 al. 2023 published in Management Science finds that
9 on these unregulated -- what they describe as tier 2
10 exchanges which are also the incremental exchanges
11 on CoinMarketCap and not Coin Metrics wash trading
12 is 70 to 80 percent of total volume, you know.
13   So it was on the basis of their research,
14 which is peer reviewed and published in a high
15 quality journal, that contributed my decision to use
16 the Coin Metrics universe where Kevin Lu and his
17 team at Coin Metrics believe based on a rigorous
18 process that at least at most, which I interpret to
19 be more than 50 percent of volume, is legitimate.
20   Q. So you relied on Mr. Lu and not your own
21 independent analysis, is that right?
22   A. I reviewed Mr. Lu's declaration and
23 believe that Coin Metrics has a strong reputation in
24 the industry, and so I thought the best source of
25 data would be the Coin Metrics API.

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1   Q. Have you ever looked at case law to see if
2   courts used CoinMarketCap data?
3   A. I did not.
4   Q. So since you're not aware of the liquidity
5   score, can I assume that you're also not aware of
6   whether using that liquidity score has improved the
7   accuracy of CoinMarketCap's trading volume data?
8   A. I have not seen those data.
9   Q. So you didn't use CoinMarketCap as a
10   source of trading value for MAPS and OXY tokens?
11   A. I did in my rebuttal report but not for my
12   main asset liquidation discounts.
13   Q. What exchanges did you use to determine
14   the trade volume for OXY tokens as of the petition
15   date?
16   A. I used the universe of Coin Metrics
17   exchanges that cover the tokens after removing, as I
18   mentioned earlier, Lbank, ZB, and Local Bitcoins.
19   And as I recall, there are -- there's about six
20   exchanges that cover OXY, but I would have to return
21   to my underlying data material to be sure.
22   Q. Would it refresh your recollection if I
23   said you used Kraken and Bitfinex?
24   A. I believe those are two of them. I
25   believe there are more than two.

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1   Q. What exchanges do you recall?
2   A. Binance is the other one for sure.
3   Gate.io would be another one. Sitting here now, I
4   don't want to misstate anything. I want to return
5   to the backup materials.
6   Q. Well, I don't want you to guess either.
7   I'm just trying to find out what you understand.
8   But to be clear --
9   A. I think it's about six.
10   Q. To be clear, when you mentioned Gate.io,
11   was that for MAPS or for the OXY tokens?
12   A. As I recall now, it's for both, but I -- I
13   would need to go back and look at my backup
14   materials to list off the exchanges.
15   Q. What about MEXC? Do you recall using that
16   as an exchange for either MAPS or OXY tokens?
17   A. Yes.
18   Q. Do you know which one, which token?
19   A. No. Actually, I'm certain it was used for
20   Serum. I can see that in my head, but I don't
21   want to --
22   Q. Do you know --
23   A. -- I don't want to misstate anything here.
24   Q. That's fine.
25   Do you know the quality rating for MEXC on

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1   Coin Metrics?
2   A. I do not.
3   Q. Was there any quality rating below which
4   you didn't go?
5   A. My approach was to try to be as inclusive
6   as possible and not to dig too deep into what
7   percent of volume on the Coin Metrics exchanges
8   might be wash trading, and so I used the entire
9   universe with the exception of three exchanges where
10   Mr. Lu told me they are not trustworthy.
11   So the process did not involve an
12   exchange-by-exchange evaluation which is one reason
13   that I don't recall sitting here exactly which
14   exchanges were used for every asset that I
15   considered because I took the universe of Coin
16   Metrics' API after excluding those three exchanges.
17   Q. And the three you excluded were Lbank, ZB,
18   and what was the third one?
19   A. Local Bits.
20   Q. Local Bits. And is ZB just the letter Z
21   as in zebra and the letter B as in beta?
22   A. Correct.
23   Q. So you weren't looking at Coin Metrics or
24   CoinMarketCap and saying okay, I'm stopping here at
25   this rating of C. Anything below C, I'm excluding.

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1   You didn't do that in this analysis, did you?
2   A. I did not.
3   Q. You excluded only what Mr. Lu said should
4   be excluded, right?
5   A. That's correct. As we discussed earlier,
6   I confirmed unreasonable trading activity on those
7   three exchanges that I excluded.
8   Q. What sources did you use to determine the
9   trade volume of Serum tokens?
10   A. I used all of the exchanges in the Coin
11   Metrics API, again, except for the three we
12   discussed, and I believe the list for Serum which
13   was more widely traded was about 15 exchanges.
14   Q. Did you use Poloniex and Bitbox?
15   A. I don't recall.
16   Q. Do you know if Coin Metrics has a spot
17   market data quality grade for Poloniex or Bitbox?
18   A. Again, I did not use any intensive margin
19   measures of trustworthiness from Coin Metrics
20   besides the instruction from Mr. Lu to exclude the
21   three exchanges that were especially untrustworthy.
22   Q. So you didn't compare the scores for Lbank
23   on Coin Metrics or CoinMarketCap?
24   A. I did not.
25   Q. How long would it have taken you to do

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1   that; 10 minutes?
2   A. I don't think there would be incremental
3   value to the analytical exercise to including the
4   additional exchanges, given what I understand to be
5   the large share of volume on these exchanges that
6   are wash trading.
7   So I felt -- I feel that my approach of
8   including all volume on the Coin Metrics universe is
9   already quite inclusive, and a reasonable
10   alternative approach would be to haircut that volume
11   for estimates of wash trading that pervade the whole
12   industry that have been documented in the academic
13   literature.
14   Q. That wasn't my question.
15   MR. GWYNNE: Can you read my question
16   back, please.
17   (The preceding question was read back as
18   requested.)
19   A. I can't speculate how long it would take
20   to evaluate each exchange.
21   Q. (By Mr. Gwynne) I didn't ask you to
22   evaluate each exchange.
23   A. That's what you said.
24   Q. I'll ask the question again.
25   How long would it have taken you to

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1   compare the spot market data quality grade for Lbank
2   as compared to other exchanges on either Coin
3   Metrics or CoinMarketCap?
4   A. I don't think I've seen spot market
5   quality grades from Coin Metrics for each of their
6   exchanges, but obviously, if I had both of those
7   numbers in front of me, it would be immediate.
8   Q. Now, you criticized Mr. Konstantinidis'
9   use of volume during the 24 hours prior to the
10   petition date, correct?
11   A. Yes.
12   Q. And one of the reasons you criticize his
13   use of that volume during that 24-hour period is
14   because there was a spike in volume that occurred on
15   November 10th, correct?
16   A. The 24 hours before the petition time that
17   he uses is associated with elevated volume relevant
18   to the surrounding periods for the at-issue tokens.
19   MR. GWYNNE: Can you read back my question
20   again, please.
21   (The preceding question was read back as
22   requested.)
23   A. I'm uncomfortable with the word spike
24   which is why I used elevated in my response. I
25   think -- I would want you to define spike.

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1   Q. (By Mr. Gwynne) Well, how do you define a
2   spike in trading volume?
3   A. A large increase that does not persist
4   over time.
5   Q. I mean, when you testified earlier you'd
6   been using the word spike, right? When you talked
7   about --
8   A. Uh-huh.
9   Q. -- volume on exchanges that you find not
10   credible --
11   A. Uh-huh.
12   Q. -- you talked about spikes --
13   A. Yeah.
14   Q. -- right?
15   A. Yeah.
16   Q. What is the minimum increase that
17   constitutes a spike when you use that term?
18   A. I don't have a specific increase in mind.
19   Q. Would a 20 percent increase in traffic
20   constitute a spike?
21   A. It would depend on the dynamics of the
22   asset over time. I do believe that
23   Mr. Konstantinidis' initial volumes are inflated
24   relative to the surrounding periods because of his
25   use of petition day volume where there was a great

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1   deal of selling pressure on these tokens, and thus,
2   heightened trading activity. I don't have an
3   opinion on whether they -- that would exactly be a
4   spike or not.
5   Q. So you're saying that the volume increase
6   in that 24 period [sic] may have been an increase
7   but might not have been a spike, right?
8   A. I don't think that it's material to my
9   opinion --
10   Q. That's not --
11   A. -- about his choice of initial volume.
12   Q. But that's not my question, okay. I
13   understand it's not material to you, but I still get
14   to ask you questions and would respectfully ask if
15   you could read back the question and that you answer
16   what I asked, please.
17   (The preceding question was read back as
18   requested.)
19   A. Looking at Exhibit 5A and 5B of my
20   rebuttal report, what we like to call eyeball
21   econometrics suggests that I would be willing to
22   call period of the 24 hours before November 11th a
23   spike for both MAPS and OXY and very clearly so for
24   Serum.
25   Q. Thank you. That's actually --

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1   A. Sorry. I'll get there.
2   Q. That's fine, and that's very helpful, but
3 I would ask if you want to look at something, in the
4 future, ask me before you do it because I'm trying
5 to know what you understand without --
6   MR. GLUECKSTEIN: We're making this a
7 memory test. You could just show her the documents
8 and ask her.
9   MR. GWYNNE: I appreciate that I could
10 show her documents, but I don't want to. I'm trying
11 to understand what she -- what she really knows.
12 She didn't even do all the work.
13   A. I have a lot of pages.
14   Q. I understand. I appreciate that. That's
15 why people just say, you know, can I look at that
16 chart?
17   A. Okay. Sorry.
18   Q. I would have said sure.
19   A. I will -- I apologize. I will ask before
20 I open the report.
21   Q. Thank you.
22   A. I thought I actually -- sorry. I actually
23 thought --
24   Q. It's not a problem.
25   A. -- I was allowed to look at anything that

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1 hand been handed to me.
2   Q. It's not a problem at all.
3   Now, do you know whether the 24-hour
4 period that Mr. Konstantinidis actually used
5 included what you just called a spike in volume?
6   A. I believe it did.
7   Q. Are you sure?
8   A. I am sure that the volumes he employed as
9 initial volumes for his liquidation analysis were
10 elevated relative to the period on either side.
11 That's the extent of my knowledge that I want --
12 that I can be affirmative about without looking at
13 exhibits.
14   Q. Well, is it fair to say -- and if you want
15 to look at something on this, you can, but you're
16 not sure whether his 24-hour period included what
17 you referenced as a spike or not, correct?
18   A. I'm pretty sure it did because I think
19 that was leading up to 11/11, and he took the 24
20 hours of the petition date, as I recall, from his
21 report.
22   Q. So you believe the spike occurred within
23 the 24 hours. Is that your testimony?
24   A. I believe so, yes.
25   Q. Okay. Now, you excluded the increase in

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1 volume that occurred between the November 1, 2021 --
2 sorry -- the November 1, 2022 Coinbase article to
3 the petition date, right?
4   A. CoinDesk.
5   Q. CoinDesk. I'm sorry.
6   A. Yes.
7   Q. And why did you exclude that period after
8 the CoinDesk article from the MAPS and OXY trade
9 volumes?
10   A. I did not just exclude it from the MAPS
11 and OXY volumes. I used the same estimation period
12 across all 1321 digital assets that I considered,
13 and I chose to end the estimation period on
14 November 1st, 2022 because I do not believe that the
15 uncertainty that existed in that period between
16 November 2nd and November 11th would reasonably
17 persist after the bankruptcy over the course of a
18 likely liquidation process.
19   Q. So is it fair to say that you were
20 concerned that the increase in trading that resulted
21 from that news event affected the trade volume after
22 the article was published?
23   A. Yes. I believe there was selling pressure
24 that we can see in the dramatic price collapse over
25 that period, and that selling pressure manifested in

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1 heightened trading activity.
2   Q. So the market was responding to the
3 CoinDesk article, in your view?
4   A. And other news that was arising about FTX.
5   Q. And it's normal in the cryptocurrency
6 market for trades to increase or decrease based on a
7 news event, right?
8   A. Yes.
9   Q. And there were other events, news events,
10 during the one-year period that you did include the
11 trade volume data from November 1, 2022 back to
12 November 1, 2021, right?
13   A. I chose a relatively long period precisely
14 so that I could capture dynamics across market
15 cycles and ensure that no specific news event would
16 bias my estimate.
17   Q. I don't think that was my question, so
18 I'll try it again. I understand that's what you
19 did, but my question was: There were news events
20 that occurred during the one year that you did use
21 to determine trading volume, right?
22   A. Of course.
23   Q. And during that one-year period that you
24 used to determine trading volume for MAPS and OXY
25 tokens, the market reacted to those news events,

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1 right?
2   A. It did.
3   Q. And did you exclude those days where
4 traffic increased or decreased because of a news
5 event during the one-year period that you used to
6 determine market trading volume?
7   A. I did not.
8   Q. Why not?
9   A. Because the uncertainty in the markets
10 just before the petition date was, in my view,
11 unprecedented, and it was especially relevant -- it
12 was especially relevant for the at-issue tokens with
13 close ties to FTX, and so a more conservative
14 approach would be to start before the CoinDesk
15 article and then to use a consistent and long enough
16 period so as to capture what an average trading day
17 would like look.
18   So if you said that oh, yes, there were
19 news events in that one-year period, I would
20 similarly expect that after the petition date, there
21 would also be news events that would occur from time
22 to time and would affect trading volume and
23 volatility. And so by using the average over a
24 one-year period, I think I balance, you know, all --
25 I -- I incorporate a balance of all of those events

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1 without the extreme uncertainty that occurred just
2 before the petition date.
3   Q. Now, if you used the normal market
4 response to the CoinDesk article as part of your
5 trade volume, then your one-year period would have
6 included the spike, right?
7   A. If I shift the estimation period to be the
8 one year ending on November 10th or shift the
9 estimation period to be the six months ending on
10 November 10th, my asset liquidation discounts remain
11 at a hundred percent for both MAPS and OXY --
12   Q. I understand that.
13   A. -- so I actually don't think that it
14 matters very much for my analysis of the at-issue
15 token.
16   Q. I understand that it doesn't matter to you
17 and your analysis. We obviously disagree with that,
18 so I'm just trying to ask you whether it would
19 affect the volume.
20   Would it have affected the trading -- the
21 average trading volume if you used the period from
22 the petition date back one year?
23   A. Yes. I'm sure it would affect the volume.
24   Q. And it would affect the volume by
25 increasing the daily volume, correct?

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1   A. I believe so, yes.
2   Q. You state when traders purchased digital
3 assets from FTX or Alameda that they were -- that --
4 sorry. Let me rephrase it.
5   I think you testified earlier today a
6 couple times that when purchasers bought MAPS or OXY
7 tokens, they were assuming certain risks, right?
8   A. Yes.
9   Q. And one of the risks that these purchasers
10 assumed was that the debtor could liquidate its
11 holdings and crash the market. Is that fair to say?
12   A. Yes.
13   Q. And it was known before the petition date
14 that the debtor had a high percentage of MAPS
15 tokens, right?
16   A. Yes.
17   Q. And it was known before the petition date
18 that the debtor had a lot of OXY tokens, right?
19   A. Yes.
20   Q. And that when you say purchasers assume
21 that risk, by definition, you're saying they had to
22 know about it, right?
23   A. Right.
24   Q. And isn't it true, then, that the market
25 price -- the spot market price already included a

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1 discount for that risk in the price as of the
2 petition time?
3   A. No, because such a liquidation had not yet
4 commenced, and so there was uncertainty about
5 whether there would be a liquidation. The entire
6 market thought at any time before or after the
7 collapse of FTX that FTX was about to sell all of
8 its holdings in MAPS and OXY, and the price would
9 immediately go to zero.
10   So it was only an expectation for some
11 market participant, perhaps erroneously, perhaps
12 not, having some belief that FTX would not sell all
13 of its holdings in MAPS and OXY that leads those
14 tokens to have positive prices in markets.
15   Q. There's a risk when you buy stock in a
16 public company that that public company is going to
17 file bankruptcy, right?
18   A. That's right.
19   Q. And that risk is priced into the stock
20 when you buy it, right?
21   A. It can be. There are many models about
22 what shapes investor beliefs and the degree to which
23 they may not be rational and may not price in all
24 risks, you know, GameStop prices being Exhibit A, so
25 I -- I don't want to sort of comment on exactly what

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1   risks the market does and does not price in because
2   that's beyond the scope of my analysis.
3   Q.   Well, you testified that investors assume
4   the risk that the debtor would crash the market by
5   selling all its tokens, right?
6   A.   That's right.
7   Q.   So since you're saying that, did you
8   analyze the petition time prices of MAPS and OXY
9   tokens to determine whether the market had priced
10   that risk already into the tokens?
11   A.   I think you might misunderstand my use of
12   the term risk. What I mean is that when a customer
13   purchased a MAPS or OXY token, they assume a risk
14   that in a bad state of the world for their position,
15   the FTX holdings might suddenly be liquidated, but
16   presumably they believed that the probability of
17   that happening was less than a hundred percent, or
18   they would not have presumably acquired their
19   position.
20   So the investors in these tokens at the
21   time they purchased the tokens had some set of
22   beliefs about the probability of this bad state of
23   the world in which FTX is compelled to or chooses to
24   liquidate its tokens.
25   And that's just -- when I use the term

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1   risk, it means that there is some positive
2   probability of this bad state of the world, what we
3   would call, like, a left tail outcome, thinking
4   about a probability distribution, and that bad state
5   of the world has, in fact, come to pass.
6   And so my contention earlier was that the
7   creditors who assumed that left tail risk which was
8   not guaranteed to happen when they purchased the
9   tokens but was one of the possible future states of
10   the world should now that it has, in fact, come to
11   pass bear the cost of that risk and not other
12   investors who purchased an asset like Bitcoin where
13   debtor liquidation of that or FTX liquidation of
14   that asset would not reasonably have been expected
15   to create this bad state of the world in which the
16   price goes to zero.
17   Q.   I think I understand what you're saying
18   about the risk, but I think you're not answering my
19   question which is just simply to what extent, if
20   any, did the market price of a MAPS or OXY token on
21   the petition date reflect the risk that FTX was
22   going to file bankruptcy and liquidate all of its
23   tokens?
24   A.   The decline -- I mean, the decline in the
25   price over the preceding days suggests that the

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1   market was starting to incorporate news about the
2   bankruptcy. I don't believe it was fully
3   incorporated since the price continued to declined
4   as can be seen in Figure 4. But overall, I can't
5   speak to the beliefs of market participants about a
6   particular token.
7   Q.   So you don't know if it was already
8   factored in 25 percent of the price of the token or
9   75 percent of the price of the token?
10   A.   Exactly.
11   Q.   Do you know what market efficiency is?
12   A.   Yes.
13   Q.   What is it?
14   A.   In an efficient market, all available
15   information is incorporated into the price.
16   Q.   Do you have an opinion whether the
17   cryptocurrency market for MAPS or OXY tokens is
18   efficient?
19   A.   I don't have a strong opinion one way or
20   the other on that.
21   Q.   Do you have a weak opinion one way or the
22   other on that?
23   A.   I do not wish to present weak opinions, so
24   I do not have any opinion.
25   Q.   Do you consider market efficiency to be

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1   important when valuing a cryptocurrency?
2   A.   That was not part of my analysis, so I
3   would --
4   MR. GWYNNE: Let's go off the record.
5   (A break was taken, and the previous
6   question was read back as requested.)
7   A.   I don't think any bill to market is
8   perfectly efficient, but I don't think that the
9   degree of efficiency is relevant for my analysis of
10   -- the specific level of market efficiency was not
11   employed in my estimation of asset liquidation
12   discount.
13   Q.   (By Mr. Gwynne) So you determined that the
14   asset liquidation discount without regard to whether
15   the market was already efficient with respect to
16   certain information, is that right?
17   A.   I did not conduct an analysis of market
18   efficiency as part of my assignment.
19   Q.   What factors would purchasers in the spot
20   market for MAPS or OXY tokens consider when
21   purchasing them?
22   A.   I cannot speak to the motivations of
23   purchasers of MAPS and OXY tokens.
24   Q.   I didn't ask you what their motivation was
25   for making a purchase. I asked you what they would

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1    be aware of in an efficient market, what types of
2    things.
3        A.  I think the efficient market hypothesis
4    assumes that traders have perfect and up-to-date and
5    complete information about the assets that they're
6    trading, and this is never perfectly true in
7    reality.  If the markets were these tokens were
8    efficient, I would assume that traders were
9    incorporating their beliefs, which do not need to be
10   rational, as well as information they may obtain
11   about the asset.
12       Q.  So in an efficient market, investors would
13   be aware of public information?
14       A.  Investors would be aware of public
15   information, yes.
16       Q.  Like the fact that the debtor had, you
17   know, the vast majority of the MAPS and OXY tokens,
18   right?
19       A.  I would think so, yes.
20       Q.  And do you think investors were -- let me
21   rephrase that.
22           As part of your analysis, did you consider
23   whether investors were aware of the locked token
24   schedule for MAPS and OXY tokens?
25       A.  The locked tokens were provided to me at a
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1    customer account level with according vesting
2    schedules.  I do not know to what degree those
3    schedules were public information.
4        Q.  We talked about Lbank earlier and the fact
5    that you excluded the Lbank trading volume from MAPS
6    or OXY tokens, whatever was reported on Lbank,
7    right?
8        A.  That's correct.
9        Q.  And with respect to MAPS, if you included
10   Lbank, the average daily trading volume would have
11   increased from a little over 500,000 to 1.7 to 1.8
12   million, correct?
13       A.  I have not done that analysis because I
14   included those exchanges for all of the 1321 digital
15   assets that I considered before evaluating the
16   discount.
17       Q.  Do you believe that the terms price
18   impact, transaction cost, and discount all mean the
19   same thing in finance?
20       A.  It depends on context, at the risk of
21   sounding like a university professor.
22       Q.  Give me the context in which those terms
23   all mean the same thing, if any.
24       A.  In the context of the Kyle and Obizhaeva
25   model, what they termed the transaction cost as a
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1    percent of the price incorporates the price impact
2    component as well as a bid ask spread cost.
3            So in the case of that model or that
4    context, the price impact is not exactly the same as
5    transaction cost because there's also a bid ask
6    spread.
7        Q.  So what's the difference between price
8    impact and transaction cost, if you're saying
9    they're not the same?
10       A.  Within the Kyle and Obizhaeva framework,
11   what they describe as a transaction cost includes a
12   bid ask spread and the price impact, and I used the
13   term asset liquidation discount to refer to that
14   transaction cost that I estimate using their model.
15       Q.  And when I asked you if the terms meant
16   the same thing, I asked you about three terms,
17   right.  I didn't just say price impact and
18   transaction cost; I also said discount.
19       A.  Yeah.  I believe I discussed that.
20       Q.  I think you were just testifying about
21   transaction cost and price impact.
22       A.  No.  I said that the -- I termed
23   transaction cost from the Kyle and Obizhaeve model
24   as the asset liquidation discount.
25       Q.  So you termed it to be that?
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1        A.  Yes.
2        Q.  The authors of the KO model didn't term
3    the transaction cost to be the discount, right?
4        A.  This is purely semantics, but they
5    describe it as transaction costs, and I use the word
6    discount.  Either way, it's a percent of the price
7    on a unit basis.
8        Q.  Is there any finance literature that says
9    the transaction cost and discount are synonymous?
10       A.  The word discount is used in a very broad
11   array of contexts.  I may obtain a discount when
12   buying a car which is a different -- a somewhat
13   different meaning than the way I'm applying the word
14   discount here, so I think we need to think about a
15   specific context before we can discuss this.
16       Q.  I don't think that answered my question,
17   respectfully.
18           MR. GWYNNE:  Can you read my question
19   back, please.
20           (The preceding question was read back as
21   requested.)
22       A.  I don't think that that is relevant to my
23   use of the term discount, so I think -- of course,
24   you know -- yeah.  I just don't -- I think that's
25   kind of a spurious question.
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1   Q. Well, I appreciate that, but if you could
2 still answer it. The question is whether there's
3 any literature that says that --
4   A. I don't know of any literature.
5   Q. Sorry. Let me finish the question.
6   A. Go ahead.
7   Q. Yeah. Let me finish the question so we
8 have a clean transcript.
9   MR. GWYNNE: If you'd just read it back
10 one more time, please.
11   A. I know -- I understand the question.
12   MR. GLUECKSTEIN: Let her read it back.
13   THE WITNESS: Okay.
14   (The preceding question was read back as
15 requested.)
16   A. I don't know of any literature discussing
17 the precise meanings of the words discount and
18 transaction cost --
19   Q. (By Mr. Gwynne) Okay.
20   A. -- but I'm happy to call the asset
21 liquidation discount an asset liquidation
22 transaction cost. To me, it is immaterial to the
23 real impact.
24   Q. Are you aware of the KO model ever being
25 used other than by you to determine a discount?

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1   A. I believe KO has been cited in the finance
2 and economics literature, and so my supposition
3 would be that it has been used to calculate
4 transaction costs by others, but I determined that
5 it was useful for my application based on the method
6 itself and not based on other use of it.
7   Q. Has the KO model ever been used to value
8 an asset?
9   A. For this analysis, I reviewed subsequent
10 work by Kyle and Obizhaeva who used their existing
11 method, but I did not do -- I do not know of other
12 papers using their methods to value assets
13 specifically. I did not think that was necessary as
14 part of my analysis.
15   Q. Are you aware of any literature where the
16 KO model has been used to value a cryptocurrency
17 asset?
18   A. As we discussed earlier, the Ghaidarov
19 2021 paper evaluates the Kyle and Obizhaeva
20 liquidity measure in digital asset markets. And I
21 believe that if the liquidity measure performs well,
22 that implies that the transaction cost formula,
23 which derives from that liquidity measure, would
24 also perform well.
25   Q. But that's not my question, respectfully.

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1 I understand that you think it would perform well,
2 but my question is whether the KO model has ever
3 been used to value a cryptocurrency asset.
4   A. It's been used to assess liquidity which
5 is directly related. I'm not using it to value a
6 cryptocurrency asset, so I kind of disagree.
7 That's -- that's not how I'm using it. I don't know
8 if other people have used it in that way. I'm using
9 it to assess the impact of price on selling a
10 position.
11   Q. Do you conclude that the MAPS and OXY
12 tokens are valueless?
13   A. No.
14   Q. What value do they have in your analysis?
15   A. So my asset liquidation discounts do not
16 include a fundamental valuation of these tokens. In
17 my rebuttal report, I suggest that because the
18 Oxygen protocol is defunct and the OXY token is a
19 utility token, for that protocol, it likely has
20 negligible value as of the petition date, and I do
21 not opine on the fundamental value of MAPS.
22   Q. Who told you the OXY ecosystem was
23 defunct? Do you know that for a fact, or did
24 someone tell you that?
25   A. I read it in news articles. I don't

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1 remember them. I believe the news articles are
2 cited in my report.
3   Q. Thank you.
4   The KO model uses certain coefficients in
5 its calculation of transaction costs, right?
6   A. Yes.
7   Q. And were those coefficients based on any
8 particular data?
9   A. Yes.
10   Q. What data?
11   A. They used data from the NASDAQ and New
12 York Stock Exchanges from the early 2000s.
13   Q. And the coefficient from the NASDAQ data
14 was different than the coefficient from the New York
15 Stock Exchange data, correct?
16   A. A little bit, yes.
17   Q. Why is that?
18   A. The underlying data differed --
19   Q. How --
20   A. -- slightly, and so the coefficients are
21 slightly different.
22   Q. How did the data differ that made the
23 coefficients differ?
24   A. I don't know. I didn't work with it.
25   Q. Well, how can you apply that model to the

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1 dataset in this case if you don't know what factors
2 would cause the coefficient to change?
3   A. I used the average of the coefficients
4 from their estimates with NASDAQ and the New York
5 Stock Exchange data to be rigorous, but the
6 estimates are very similar in sensitivity to the
7 analyses that we ran for NASDAQ coefficients or New
8 York Stock Exchange coefficients.
9   Q. So you ran the model using coefficients
10 that were generated by data from the New York Stock
11 Exchange or the NASDAQ, right?
12   A. Yes, although it's important to emphasize
13 here that the model is intended to apply and the
14 calibrated formula with those coefficients is
15 intended to apply across a diverse range of assets
16 and markets including, according to Kyle and
17 Obizhaeva, commodities, foreign currencies, and bond
18 markets. And so for that reason as well as other
19 reasons we've discussed, I believe that it is
20 reasonable to apply them to digital asset markets.
21   Q. So KO in their article doesn't say
22 specifically, right, that their model can be used
23 with respect to cryptocurrencies, right?
24   A. That's correct. Well, at the time they
25 were doing their research, such markets barely

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1 existed.
2   Q. But they did exist?
3   A. They did.
4   Q. And you chose to use a model with
5 coefficients that weren't based on the data in the
6 relevant market, right?
7   MR. GLUECKSTEIN: Object to the form.
8   A. So again, the coefficients are not
9 designed to be solely applicable to those stock
10 markets, and in fact, Kyle and Obizhaeva themselves
11 applied their calibrated model with those
12 coefficients to other types of markets such as
13 corporate bond markets and treasury markets.
14   Q. (By Mr. Gwynne) Did you do anything, any
15 type of research or study to determine what the
16 coefficients would be if you used data from the
17 cryptocurrency market?
18   A. I did not.
19   Q. Can application of the KO model be used to
20 determine the discount that renders a token
21 valueless, notwithstanding that the token can be
22 sold for positive dollar amounts?
23   A. The purpose of the KO model is not to
24 value an asset, but rather, to assess the
25 transaction cost from a given decision to take a

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1 position. So I -- I don't -- I don't think we can
2 use the term value to describe the results as you
3 did.
4   Q. So the KO model does not determine the
5 value of a cryptocurrency token. We can agree on
6 that?
7   A. Correct.
8   Q. The Chaffe -- is that how you pronounce
9 it? C-H-A-F-F-E?
10   A. I've seen it with both two Es and one
11 E. I'm not exactly sure. I think Chaffe is the
12 way to pronounce it, though.
13   Q. Do you agree that the Chaffe discount
14 model always overstates the discount for high
15 volatiles?
16   MR. GLUECKSTEIN: Object to the form.
17   A. I don't have a reason to believe that it
18 always overstates a discount. I wouldn't know what
19 the relevant benchmark was.
20   Q. (By Mr. Gwynne) Do you have a reason to
21 believe that the Chaffe discount model overstates
22 the discount for high volatiles?
23   MR. GLUECKSTEIN: Object to the form.
24   A. I think in longer horizons, the Chaffe
25 model must understate the discount because it

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1 bizarrely produces lower discounts at longer
2 horizons than at shorter horizons, and it cannot be
3 the case that an asset that cannot be sold for ten
4 years is worth more than the same asset that cannot
5 be sold for five years. So in that sense, I believe
6 it understates the discount at longer horizons.
7   Q. (By Mr. Gwynne) Do you agree that the
8 Chaffe discount model can overstate a discount for
9 high volatiles?
10   MR. GLUECKSTEIN: Object to the form.
11   A. I disagree with that statement as a
12 general matter.
13   Q. (By Mr. Gwynne) Do you agree that the
14 Chaffe discount model can overstate a discount for
15 highly volatile tokens?
16   A. In practice for the horizons relevant to
17 my report, my estimated discount is based on the
18 Ghaidarov and Finnerty models using a simulation
19 that falls in between the Chaffe and the models that
20 Mr. Konstantinidis uses.
21   So within the context of the analysis that
22 I did here, I believe the Chaffe model overstates
23 the discount relative to what I think is the
24 superior model that I used. We can see that in an
25 exhibit in my rebuttal report where my simulated

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1 discount falls in between the Finnerty and the
2 Chaffe going out to seven years.
3   Q. So then you would agree that the Chaffe
4 discount model can overstate the discount for highly
5 volatile tokens?
6   A. Okay. Yes, it can.
7   Q. Do you agree that the Finnerty discount
8 model tends to understate the discount for high
9 volatiles?
10   A. Only when applied via the analytical
11 approximation to the model offered in Finnerty 2012
12 and not in the simulated version that I used.
13   Q. Do you believe that the KO model
14 characterizes liquidity well in cryptocurrency
15 markets such as those for Bitcoin and Ether?
16   A. Based on the results from Ghaidarov 2021,
17 I believe it does.
18   Q. What does it mean to characterize
19 liquidity?
20   A. The way that those authors analyzed and
21 evaluated the different measures was to compare them
22 to estimates using high frequency order book-based
23 data where liquidity could be precisely estimated as
24 a benchmark.
25   Q. Do you believe the KO model characterized

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1 liquidity well in the cryptocurrency market for MAPS
2 tokens?
3   A. I believe it was the best available option
4 to me in conducting a systematic estimate of the
5 asset liquidation discount that could be applied to
6 all the digital assets under my consideration.
7   Q. But the best option -- you did not
8 technically answer my question. Do you believe that
9 the KO model characterizes liquidity well in the
10 cryptocurrency markets for MAPS tokens.
11   A. I did not undertake a liquidity analysis
12 on an asset-by-asset basis as far as my work.
13   Q. Do you believe the KO model characterizes
14 liquidity well in the cryptocurrency markets for OXY
15 tokens?
16   A. The same answer applies as before.
17   Q. When you say as before, you mean by --
18   A. The previous -- the immediate previous
19 question.
20   Q. Did you make any modifications to the KO
21 model to adjust it for digital assets?
22   A. I did not.
23   Q. If a model computes a discount in excess
24 of a hundred percent, does that imply that the
25 application of the discount to a value would render

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1 the value negative?
2   A. As we discussed earlier, the fact that the
3 model produces discounts in excess of a hundred
4 percent reflects the high degree of illiquidity of
5 these markets relative to the size of the debtor
6 holdings where the debtor is holding 6,000 to 20,000
7 times the daily trading volume.
8   Q. Do you agree with the statement that a
9 model providing results that equal or exceed hundred
10 percent discounts may have a theoretical problem
11 because it seems logical that a discount would not
12 reduce the value to zero or less?
13   A. No. I disagree with that statement.
14   Q. In your application of the KO model, you
15 believe that the price impact component of the KO
16 formula is multiplied by two to infer the price
17 impact, right?
18   A. Yes. That has to do with the difference
19 between the final price versus the average price
20 that the asset is sold at.
21   Q. Why do you multiply it by two?
22   A. So I don't multiply it by two in the main
23 analysis. In my rebuttal report, there is a need to
24 adjust in order to get the average price that a
25 token is sold at, and that adjustment requires

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1 multiplication by two.
2   Q. Can you explain that in laymen's terms?
3   A. I'd like to -- it's all laid out --
4   Q. Sure.
5   A. -- in the appendix.
6   Q. Footnote 125 in your rebuttal report is
7 where you talk about that, if that's helpful. Where
8 is the appendix where you actually do the
9 calculation?
10   A. So as it states on page B3 in footnote 12,
11 for example, for some of these models, the estimates
12 are divided by a factor of two to convert price
13 impact estimates to average impact estimates.
14 Otherwise, you're getting the total difference
15 between the first price, the price it starts at, and
16 the last price whereas if you go along trading, the
17 price is steadily declining. And so by dividing
18 that by two, you get the average price between the
19 start price and the final price.
20   Q. So is it your testimony that by
21 multiplying the price impact by two that your
22 discount is not being doubled?
23   A. That's right. It is essentially a
24 technicality.
25   Q. In your asset liquidation discount model,

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1   do you assume that FTX and Alameda sold all of their
2   OXY and MAPS tokens on the petition date?
3   A. No. I do not assume that.
4   Q. Do you assume they were sold over time?
5   A. The KO model relies on an assumption that
6   market equilibrium leads to a trading strategy in
7   which the position is implemented at what they term
8   a natural speed of trading that balances desire for
9   fast execution with a desire to minimize transaction
10 costs. The KO model does not produce a time to
11 liquidation, and that also is not part of my
12 analysis.
13   Q. So your analysis doesn't assume any
14 particular time period associated with the sales
15 that result in the asset liquidation discount?
16   A. Correct.
17   Q. With respect to the Ghaidarov discount
18 model, do you agree that at higher volatilities, the
19 model produces a discount that is too large?
20   A. No.
21   Q. The term free float; does that refer to
22 the amount of tokens that are actually available for
23 trading in the marketplace?
24   A. Yes.
25   Q. Does the amount of coins in the free float

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1   affect the trading volume?
2   A. Not necessarily.
3   Q. So if the free float is, say, three
4   percent of the maximum supply of tokens, do you
5   think it's fair to say that the trading volume would
6   increase in the future as tokens are unlocked?
7   A. Not necessarily. Trading volume reflects
8   market participant interest in buying and selling
9   the token, not how many tokens there are available
10 to sell.
11   Q. Have you looked at other mature tokens and
12 how trading volume reacted when additional tokens
13 were unlocked?
14   A. I have not.
15   Q. Why not?
16   A. I don't think it is relevant to my
17 analysis for this matter.
18   Q. Why not?
19   A. Because all of the debtor's holdings are
20 unlocked, and I was asked to consider the impact on
21 the price in the liquidation commencing at the
22 petition date of all of those unlocked tokens.
23   Q. How did those tokens miraculously become
24 unlocked?
25   MR. GLUECKSTEIN: Object to the form.

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1   MR. GWYNNE: Let me withdraw the question.
2   Q. (By Mr. Gwynne) When you say all the
3   debtor's tokens were unlocked, do you mean that they
4   technically had been unlocked according to their
5   scheduled time to be unlocked, or do you mean
6   something else?
7   A. My knowledge is limited to the information
8   I have from the debtor that it controls a set of
9   digital assets and that all of those assets are
10 available to be liquidated.
11   What may be driving this confusion is that
12 there were tokens that were locked from the
13 customer's perspective, for example, with tickers
14 like MAPS locked, but it was FTX that controlled
15 those token lockup schedules and could unlock them
16 at will, very similar to how employees at
17 conventional companies are compensated with, for
18 example, restricted stock units or options that have
19 vesting schedules, and the company controls those
20 shares. But from the employees' perspective, they
21 are quote, unquote locked.
22   Q. How do you know the debtor could unlock
23 tokens at will?
24   A. My understanding is that all of the
25 holdings that I am considering in my analysis are

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1   unlocked from the debtor's perspective.
2   Q. You said the debtor could unlock them at
3   will. I'm asking what you base that on.
4   A. I'm not saying they were ever locked from
5   the debtor's perspective. I have no information on
6   that.
7   Q. Well, what information do you have on the
8   debtor being able to unlock tokens at will?
9   A. Again, I don't have information on whether
10 tokens were unlocked --
11   Q. You said they --
12   A. -- on the debtor's side, so I don't know
13 whether they have the ability to unlock tokens or
14 not --
15   Q. Okay.
16   A. -- because I don't know if they have
17 locked tokens, from their perspective.
18   Q. Fair enough. So just to be clear, you
19 don't have any information as to whether the debtor
20 has the ability to unlock tokens at will?
21   A. In general, no.
22   Q. Would you agree with -- are you aware that
23 researchers have said that it's reasonable to avoid
24 price drops for individual stocks to be sold by
25 restricting quantities traded to not more than five

55 (Pages 214 to 217)

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1   or ten percent of daily volume?
2   A.   That is certainly a strategy for
3   increasing prices.
4   Q.   We talked earlier -- not you and I.
5   Sorry. You answered questions earlier about whether
6   MAPS or OXY tokens become zero instantaneously or
7   whether they become discounted to zero over time.
8   Do you remember that?
9   A.   Yes.
10   Q.   And do you have any opinion on how many
11   tokens can be sold on a daily basis for how long
12   before the MAPS tokens are discounted to zero?
13   A.   I have not -- do not have a specific
14   number in mind, but as I said earlier, my
15   expectation is that the number is trivial relative
16   to total debtor holdings of these assets.
17   Q.   Well, trivial in relation to 992 million
18   at face value can still be a large number, right?
19   A.   My estimate suggests that if the debtor
20   were to start selling these holdings, the price
21   would go to zero very quickly such that while there
22   would be potentially positive value from initial
23   tokens, as a fraction of total face value, it would
24   be so small as to round down to zero in a meaningful
25   approximation.

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1   Q.   Well, again, you're not saying anything
2   different than what you said earlier on that, are
3   you?
4   A.   No. I would not have changed my opinion.
5   Q.   Did you ever hear of the rational choice
6   theory? You're not familiar with that?
7   A.   I'm not familiar with that.
8   Q.   It's economic theory that assumes rational
9   behavior.
10   A.   I'm certainly familiar with the concept
11   of, you know, rational behavior in markets.
12   Q.   Doesn't traditional finance theory assume
13   that both the investor and the market are rational?
14   A.   Not all economic and finance theory.
15   Q.   Of course not. But doesn't traditional
16   finance theory assume that both the investor and the
17   market are rational?
18   MR. GLUECKSTEIN: Object to the form.
19   A.   No. I don't think so. Key assumptions,
20   for example, around no arbitrage don't require every
21   investor to be rational.
22   Q.   (By Mr. Gwynne) Do your theories in your
23   research work, are they predicated on rational
24   markets and rational behavior?
25   A.   Not necessarily.

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1   Q.   So some of your work is based on just an
2   irrational market and irrational actors?
3   A.   I don't know that any of my work
4   specifically relies on -- I mean, especially this
5   work. Yeah. I'm -- I'm sorry. How is that
6   relevant?
7   Q.   I'm sorry, but I'm asking the questions.
8   A.   Okay.
9   Q.   You just get to answer them. Sorry.
10   Can you answer the question? I mean, in
11   your work, do you -- well, in your work on this
12   case -- let's start with that -- did you make any
13   assumptions about the market acting irrationally?
14   A.   I don't believe so.
15   Q.   Did you make any assumptions about the
16   debtor or anyone else acting irrationally?
17   A.   No.
18   Q.   So did you make assumptions that the
19   market and the debtor would react rationally?
20   A.   The models that I used, both the discount
21   for lack of marketability and the asset liquidation
22   discount, rely on markets being in equilibria where
23   arbitragers address mispricings. However, they
24   don't rely on assumptions about the rationality of
25   every market participant.

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1   Q.   Again, I didn't say every market
2   participant.
3   A.   Well, I don't have anything to say about
4   the rationality of market participants.
5   Q.   When you determined the discounts for the
6   MAPS and OXY tokens, did you make any assumptions
7   about whether the debtor or the creditors would act
8   reasonably in liquidating assets?
9   A.   Yes. I assumed that liquidation would
10   proceed in an orderly manner, and I interpreted that
11   to align with the notion of a natural speed of
12   trading as described in the Kyle and Obizhaeva
13   model.
14   Q.   Well, why would you assume liquidation
15   would proceed in an orderly manner?
16   A.   Because that was part of my assignment.
17   Q.   Did that make sense to you?
18   A.   Yes.
19   Q.   Why?
20   A.   I have no reason to believe that Mr. John
21   Ray and his team would wish for an disorderly
22   liquidation.
23   Q.   Would that be rational?
24   A.   I think it would be -- I mean, I think I'm
25   perhaps going beyond my -- the purview of my work

56 (Pages 218 to 221)

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1   here, but I would expect that to pursue a disorderly
2   liquidation would be contrary to the fiduciary duty
3   that they have to the estate.
4   Q.   And who talked to you about the fiduciary
5   duty the debtor owes to the estate?
6   MR. GLUECKSTEIN: Objection; calls for a
7   legal conclusion. You can ask if she had this
8   discussion, but I think she just said it's outside
9   the scope of her work.
10   A.   It was just my personal opinion. I have
11   not talked to anyone about it.
12   Q.   (By Mr. Gwynne) And with respect to that
13   fiduciary duty that you're talking about, do you
14   think that should move the debtor to maximize the
15   value of its assets?
16   MR. GLUECKSTEIN: Objection; calls for a
17   legal conclusion.
18   A.   That is beyond the scope of my analysis.
19   Q.   (By Mr. Gwynne) So does your analysis
20   consider whether there are things the debtor could
21   do with its MAPS and OXY tokens to maximize their
22   value?
23   A.   I only considered an orderly liquidation
24   that is the sale of the tokens.
25   Q.   Are there other means of handling those

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1   assets that could maximize their value?
2   A.   I don't know of any that would
3   consistently lead to cash proceeds in US dollars
4   that could be returned to creditors. That said, I
5   was not asked to consider other means, so I can't
6   speak to it formally.
7   Q.   Have you considered whether if the debtor
8   burns a portion of its tokens that the remaining
9   tokens would have more value?
10   A.   I'm not sure. It would depend on market
11   expectations and dynamics. Given for -- you know,
12   to the degree the project for which the token has
13   utility value is defunct, it's not necessarily
14   obvious to me that that would increase the value of
15   the remaining tokens.
16   MR. GWYNNE: Can you read my question back
17   please?
18   Can you answer my question, please.
19   MR. GLUECKSTEIN: She did answer your
20   question. Now you're being argumentative with the
21   witness.
22   MR. GWYNNE: I'm not being argumentative
23   with her.
24   MR. GLUECKSTEIN: You are being
25   argumentative with her.

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1   MR. GWYNNE: You're raising your voice.
2   I'm not being argumentative. I asked her if she
3   considered it.
4   THE WITNESS: I did not.
5   MR. GWYNNE: She can say I considered it
6   or I didn't. She went ahead and explained what the
7   result would be. I wasn't asking her what the
8   result would be of considering it; I just asked her
9   if she considered it. That's different.
10   If you could please read my question back.
11   (The previous question was read back as
12   requested.)
13   A.   I did not consider that.
14   MR. GWYNNE: Thank you.
15   I think I'm going to have some more
16   questions, but this might be a good time to take a
17   five-minute break because it may make it go a little
18   quicker afterwards.
19   (A break was taken.)
20   Q.   (By Mr. Gwynne) In your volume analysis
21   for MAPS and OXY tokens, you did not assume that
22   there would be any post-petition increase in trading
23   volume, correct?
24   A.   Correct.
25   Q.   Why not?

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1   A.   As of the petition date, I would have
2   expected, if anything, investor interest in these
3   tokens to potentially decrease, and so I felt that
4   using historical volume from the year prior was a
5   reasonable assumption.
6   And in practice, my one-year historical
7   average volume is much closer to the realized
8   ex-post volumes than the 850 percent growth that
9   Mr. Konstantinidis assumes would occur in the first
10   year, generating volumes that are dramatically
11   higher than the realized ex-post volumes.
12   Q.   When you say 850 percent increase, that's
13   based on your daily volume trading average, not his,
14   right?
15   A.   I believe he assumes an 850 percent growth
16   in the first year.
17   Q.   850 percent of what, his initial --
18   A.   I would have to look --
19   Q.   -- volume estimate or your volume
20   estimate?
21   A.   I would have to look to be sure.
22   Q.   Is there any empirical data regarding
23   other mature cryptocurrencies that supports the
24   volume remaining flat for the foreseeable future?
25   A.   I imagine there are examples of other

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1   tokens where volume goes down and examples where it
2   increases. I felt the best estimate of volume in a
3   liquidation process starting at the petition date
4   would be the one-year historical volume, and I
5   viewed that as a conservative approach based on
6   information as of the petition date.
7   Q. You say you imagine that there may be
8   instances where trading went up and where trading
9   went down, right?
10   A. For the universe of tokens, yes.
11   Q. But did you as the expert do any research
12   to determine whether trading tends to go up or down
13   as tokens are released and unlocked?
14   A. As I mentioned, I did not consider any
15   unlocking of tokens, so the answer is no, I did not
16   do any research into what happens when tokens get
17   unlocked.
18   Q. Earlier I believe you said you did not do
19   a liquidity analysis on an asset-by-asset basis, is
20   that correct?
21   A. I sought to apply a single systematic
22   method to all the digital assets that I was
23   considering.
24   Q. So you don't believe that you did an
25   individual liquidity analysis with respect to MAPS,

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1   OXY, or Serum tokens?
2   A. Correct.
3   Q. Did you talk to Mr. Lu?
4   A. Not personally.
5   Q. Have you ever spoken to him at all
6   regarding this assignment?
7   A. No.
8   Q. You haven't spoken to him regarding your
9   initial report or your rebuttal report?
10   A. No.
11   Q. Did you communicate with him by email or
12   text message?
13   A. No.
14   Q. How did you communicate with Mr. Lu, if at
15   all?
16   A. His reports and opinions and access to the
17   Coin Metrics API as well as his petition time price
18   data set were all provided to me by my colleagues at
19   Analysis Group who, in turn, received some inputs
20   from Alvarez and Marsal and some from Coin Metrics
21   directly.
22   Q. So you never had a single question about
23   his report; is that fair to say?
24   A. I reviewed his report and found that his
25   methodology appeared sound, and I did not have any

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1   questions for him.
2   Q. Is there anything in his report with which
3   you disagreed?
4   A. Not that I can recall.
5   Q. Well, do you recall at some point
6   disagreeing with him about something?
7   A. I do not.
8   Q. Are you aware of him disagreeing with
9   anything in your report?
10   A. I am not aware of him disagreeing with
11   anything in my report.
12   Q. In the description of market
13   microstructure invariance, there's a phrase
14   asset-specific business time.
15   Are you familiar with that phrase?
16   A. I am.
17   Q. What is an asset-specific business time?
18   A. It is the rate at which trading activity
19   occurs in a market.
20   MR. GWYNNE: I don't have any other
21   questions, Professor. Thank you.
22   THE WITNESS: Thank you.
23   MR. GLUECKSTEIN: Thank you.
24   All right. Are we done? Thank you.
25   (Whereupon, the deposition concluded at

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1   5:38 p.m.)
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 1              CERTIFICATE
 2
 3         I, TRACI M. MERTENS, Registered Diplomate
 4   Reporter and Certified Realtime Reporter, do hereby
 5   certify that prior to the commencement of the
 6   examination, the deponent was placed under oath to
 7   testify to the truth and nothing but the truth under
 8   penalty of perjury.
 9         I DO FURTHER CERTIFY  that the foregoing
10   is a verbatim transcript of the testimony as taken
11   stenographically by me at the time, place, and on
12   the date hereinbefore set forth, to the best of my
13   ability.
14         I DO FURTHER CERTIFY that I am neither a
15   relative nor employee nor counsel for any of the
16   parties to this action in which this proceeding was
17   taken, and further that I am not financially or
18   otherwise interested in the outcome of this action.
19      In witness whereof, I have hereunto set my
20   hand this 28th day of February, 2024.
21
22
23         _____
             Traci Mertens, RDR, CRR, CSR
24           Registered Diplomate Reporter
             Certified Realtime Reporter
25           Certified Shorthand Reporter
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 1
 2        ACKNOWLEDGEMENT OF DEPONENT
 3
 4         I, SABRINA HOWELL, do hereby certify that
 5   I have read the foregoing pages and that the same is
 6   a correct transcription of the answers given by me
 7   to the questions therein propounded, except for the
 8   corrections or changes in form or substance, if any,
 9   noted in the attached Errata sheet.
10
11
12   _____
13   SABRINA HOWELL               DATE
14
15
16
17   Subscribed and sworn to before me this _____
18   day of _____, 20_____.
19
20   My commission expires: _____
21
22   _____
23   Notary Public
24
25
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 1              ERRATA
 2
 3   PAGE    LINE    CHANGE
 4   ____    ____    _____
 5         REASON:  _____
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 7   PAGE    LINE    CHANGE
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